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ABSTRACT

This document contains six major presentations from the 1984 summer workshop, "The C3 Experience: Counseling, Computers, and Creative Change," sponsored by the ERIC Clearinghouse on Counseling and Personnel Services. The first presentation, "Exponential Counseling: Computers as a Multiplier" by JoAnn Harris-Bowlsbey, reviews the role that computers and educational technology can play in expanding the present limits on counseling. The second presentation, "New Directions and Developments in NIE and DIP" by Laurabeth Hicks, presents a perspective on developments within the National Institute of Education and the Dissemination and Improvement of Practice Program (DIP), including potential implications for counseling and human services. The third presentation, "Synergyzing Counseling and Human Services" by Clayton Lafferty, pinpoints the need for changes in thinking to bring about improvements in counseling and human services. "From a Little Bit to a Big Byte: Motivating Your Staff," by Carl Berger, reviews the use of computers in education and the learning process. The fifth presentation, "Creative Sustenance: Enhancing our Capacity to Recreate Counseling" by Garry Walz and Libby Benjamin, addresses the subject of creativity, with comments and ideas of conference participants. The final presentation, "The Workplace of Tomorrow" by Libby Benjamin, describes a variety of alternative futures including employment trends and the impact of technology on occupations and workers and on education and the helping professions. (JAC)

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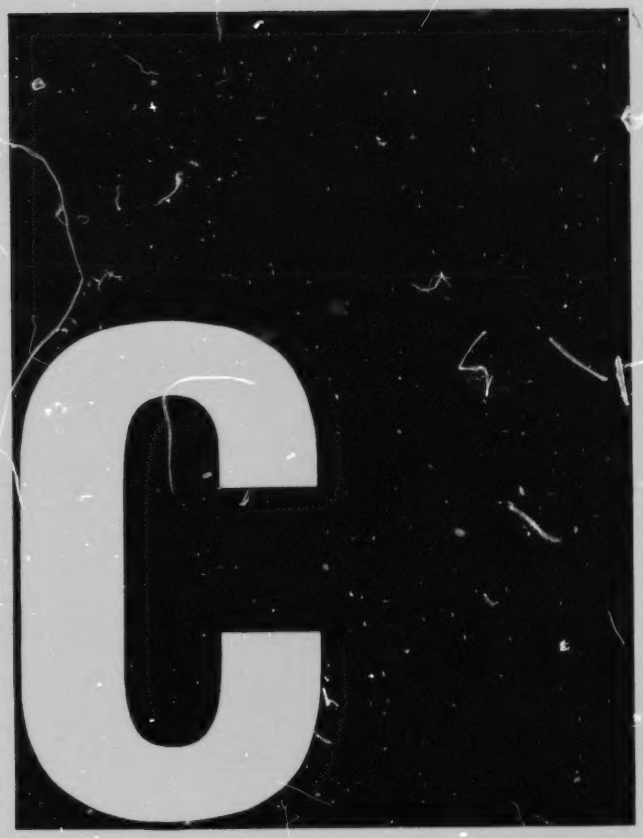

the C^3 experience

Counseling • Computers • Creative change

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THE C^3 EXPERIENCE: COUNSELING, COMPUTERS, AND CREATIVE CHANGE

Garry R. Walz
Jeanne Bleuer
Editors

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INTRODUCTION

This volume contains selected major presentations from the 1984 ERIC/CAPS summer workshop--"The C^3 Experience: Counseling, Computers, and Creative Change." A review of these papers will enable the reader to profit from many of the stimulating ideas and images which were presented during the workshop. We also hope it will recapture some of the substance and excitement for those who were there and provide a modicum of the experience for those who were not able to be present. What is missing is the dynamic interaction that took place between the participants and the presenters. The workshop was characterized by a blurring of presenter and participant with everyone contributing ideas and examining and responding to the ideas of others. Also missing are several sessions in which audio-visual aids, demonstrations of hardware and software, and/or participant hands-on experience played a major role. Obviously, these types of sessions cannot adequately be captured in printed form.

Initial keynoter for the workshop was JoAnn Harris-Bowlsbey, who sketched the role that computers and educational technology can play in expanding the present limits in the delivery of counseling. In her presentation, she explicates what computer-assisted counseling is, how it operates, and what we can look to in the future. As a pioneering spirit and a substantive innovator, Dr. Harris-Bowlsbey is making a significant contribution to the computer-assisted counseling field. Her analysis of both its operation and its potentials are worthy of the reader's attention and study.

Dr. Laurabeth Hicks, the Associate Director for the Dissemination and Improvement of Practice Division of the National Institute of Education, enhanced our workshop by her presence and her insightful remarks about future directions for NIE. As perhaps the highest placed professional counselor in the NIE hierarchy, Dr. Hicks provides an extremely useful perspective on the developments within NIE and their potential implications for counseling and human services. All persons who wish to understand and be in harmony with the future directions of NIE, as well as its efforts to improve dissemination and the utilization of resources, would be well-advised to reflect seriously on her thoughts and comments.

A satirical, but thoughtful and challenging analysis of counseling and human services was presented by Dr. Clay Lafferty of Human Synergistics, Inc. Dr. Lafferty is a dynamic human resources leader who denies conventional modes of thinking and practice and, as a result, has developed an extremely successful consulting organization. Dr. Lafferty pinpoints areas where we need to shed our atavistic thinking and behavior patterns if we are to have any hope of bringing about change and improvement in counseling and human services. His charm and wit are obvious, as are the substance and the impact of his comments and suggestions.

Doing more of what we already do has been a frequent strategy for those wishing to improve counseling. If we could only have a lower counselor-student ratio; or if we only had more money and resources, we could do the job we want to do. These old expressions have been rife in the counseling literature and at professional meetings for years. In actuality, neither reducing the counselor-student ratio or increasing the resources available to counselors can be demonstrated to improve either the amount or the quality of counseling provided to clients. Rather than "more of the same," what is needed is a creative re-look at what counseling is and how it can be delivered. In a presentation that featured extensive involvement by workshop participants, Drs. Benjamin and Walz addressed the subject of creativity—defining it, suggesting ways that we can all increase our creativity, and making direct applications of creativity to counseling. The advent of the era of technology and the greater use of it in counseling, particularly computers, offers both challenges and crises within the counseling profession. These crises of change are also unusually important opportunities to redefine and recreate the way we see counseling and the way we deliver it. This presentation can facilitate a better understanding of the creative process and how to apply it to one's own counseling activities.

An unusually broad and perceptive view of the use of computers in education and the learning process was brought to the workshop by Dr. Carl Berger, Dean of The University of Michigan School of Education. Highly versed in working with individuals and organizations in both education and business, Dr. Berger emphasizes the need for a broad understanding of the potentialities of computers and a careful and systematic approach to their implementation and use. An enthusiastic advocate of computers, he is also wary and concerned about their unrestrained use

by educators who have not done the necessary prior thinking about what they wish to accomplish and how they believe computers can help them achieve their goals. Some of his wit and contagious pleasure in his work are contained within this presentation. They should help readers seriously reflect on the use of computers, without becoming overburdened with terminology or redundancy.

A special attraction during the workshop pre-sessions was Dr. Libby Benjamin's presentation of some images of the workplace of tomorrow. The most advanced and interactive technologies will be of little use to us if we lack meaningful images of what it is we are helping people to prepare for in the future. There is no way to know exactly what the future will be; but, by gaining a broader perspective and a clearer understanding of the variety of alternative futures, we will be better prepared to assist both young and old to make the requisite plans and decisions for that future.

A good workshop is one that provides participants with both physical take-homes and stimulating ideas for professional take-off. Our hope is that this volume will serve both purposes—as a resource with concrete information that you can use in responding to needs and interests that you have but, more importantly, as a source of motivation that will stimulate you to take off using computers and technology to bring about creative changes in your own programs and services.

Garry R. Walz and Jeanne Bleuer

EXPONENTIAL COUNSELING: COMPUTERS AS A MULTIPLIER

JoAnn Harris-Bowlsbey

To start with, I want to warn you about the possible consequences of attending one of Garry's workshops. He will tell you that in late 1966 I, and a couple of counselors on my guidance staff at a high school in Oak Park, Illinois, got this idea, which was new in 1966, that perhaps the computer could help students and counselors with the career guidance task. So we began to explore that possibility, to write a proposal, and to try to get some money. And one of the very first things we did was to attend one of Garry's workshops on the New Technology. This was in Texas, I think in 1967. Lorraine Foster, who was a vocational counselor on my staff--you know, from the Voc. Ed. of 1963--attended that workshop with me, and we got all turned on to the possibility of using technology in career guidance and career development. And in the intervening years since 1967, I have gone through much frustration and much hard work and much fun--partly because I got excited by that workshop. The fact that Garry Walz is still running workshops on the New Technology in 1984 means either that he continues to keep up with the technology and to stimulate counselors to use it, or that we haven't learned it yet--I'm not sure which--and it may be a bit of both.

Let me share with you another reason why you had better be careful of attending things associated with Garry Walz. Some years ago a colleague of mine by the name of Betty Bosdell and I got to wondering what an ERIC center was, what an ERIC center did. So in 1972 or 1973 we came and spent a day or two in Ann Arbor and learned a great deal about the functioning of ERIC clearinghouses. Then Betty and I went back to Northern Illinois University, wrote a proposal, and won the bid for the ERIC Clearinghouse for Career Education for Northern Illinois University and brought in David Tiedeman as the Director. So the two close interactions I've had with Garry Walz have had an extremely powerful impact on my own personal career. So I'm just warning you--watch out! If you are going to be with him for four days, maybe some unusual things could happen to you as well.

Garry told me that he'd like me to talk about the exponential in counseling, and that led me to consider what I could do with such a title. It took me back to my calculus days which I had hoped to forget. As I thought about exponents, the

first thing that occurred to me is that I've never seen an exponent running around by itself. Any time that I've ever seen an exponent, it's always been raised a little bit, sitting nicely to the right of another number or sometimes a letter. So that's the first thing I teased out of this exponent idea: Nobody, not any developer of any computer-based system for use in counseling or guidance, ever intended that that system should run around by itself, any more than any mathematician ever intended that an exponent should run around by itself. My first point, then, is that the use of technology in counseling or guidance is always meant to be in conjunction with, in an intimate relationship with, a human counselor. And even at this time of development of computer technology, although many systems have a great deal of power, there is no intention that they should replace the counselor. Rather, the intent is that they should be used as an instrument of exponential relationship with the counselor to increase that counselor's power.

The second thing that came to me as I thought about exponents is that they are nice things--because if you are using an exponent, you don't come to a simple additive sum. You come to a very explosive kind of sum. Just imagine that you want to rate yourself as a counselor on a continuum of 1 to 10. Now, if you take 1 and raise it to the third power, well, you haven't done too much for yourself--you still have a 1, right? 1 times 1 times 1. If you consider yourself a 2 on that continuum, and you cube yourself, you get to 8. If you consider yourself a 4, you can get to 64; and if you go all the way and consider yourself a 10 as a counselor and you cube that, you get to 1,000. So you get some idea of the exponential effect that, hopefully, computer technology could have. Now in actual fact, we do not have enough research by any means to know whether the wise use of technology does in fact cube our power or square it, or whatever, but at least we are quite sure that it increases our power.

Preparing for this speech caused me to look back over my own career development. I know now that what I have been doing for years is to attempt to give myself an exponent. Let me explain that.

As a practicing high school counselor in the late sixties, I realized that the one-to-one delivery mode, which was the only delivery mode we were using then, wasn't going to enable me to reach very many students. As a director of guidance, my next step, I hoped that I could teach my staff and lead my staff to do a lot of things which would increase the impact I might have. Next, as a counselor educator

in 1973, I hoped that I might be able to expand my own impact on the hundreds of students whose lives I touched each year because those future counselors would go out and practice some of the things I preached, and in a sense, exponentially multiply my efforts. Next, I went into the full-time development of computer-based products and paper-based products, hoping that the things I had developed might be used by thousands and thousands of students every year. Then, in 1982, the American College Testing Program offered me, my staff, and my products the opportunity to merge. This was a very difficult decision for me because I had two values very much pitted against each other. One was the value of autonomy--I had not had a boss for a dozen years, and that's a pleasant condition. I had literally made my own work tasks. I had had my own money to use however I pleased. And it was difficult to give up some of that autonomy. But the other side, the other value, that finally won out was the ability through merger to have both the financial and people resources needed to give another exponential effect to my work in terms of spreading it around the United States--a million dollars spent on marketing last year, for example.

Until I prepared for this presentation, however, I didn't realize that for the last twenty years, through these various ways, I myself had been seeking an exponential possibility for my own career. So what we are talking about today is how can computer technology and the use of any of the several good computer-based information and guidance systems that exist--how can they have an exponential effect on your impact as a counseling professional? In deciding what to say to you about that, and it wasn't easy because I hadn't thought of it in this sense before, I came up with three themes that seem to fit the title and the topic.

Computer Literacy

My first theme is computer literacy. If you are going to have exponential power in terms of your outreach to students, what do you have to do or have or implement to achieve that power? It seems to me that the first thing is computer literacy.

I want to comfort you, first of all, by telling you the absolute truth. I have personally had two experiences of a technical nature. One was the short workshop that I mentioned, run by Garry Walz in Texas in 1967. The other was also in 1967 when I took Data Processing 101, a course that introduced me to what the computer

of that day could do and what it couldn't do. Actually, there wasn't a word in that course directly related to guidance and our task; but we did acquire enough basic knowledge about the computer to take those concepts and say, "How will we apply those to the career guidance and information field?" So I say that by way of comfort to you. I do not believe that you need to know how to program at all--you may want to learn to program but you don't have to learn to program. I never intend to program myself because it looks like a very boring task.

I also think it is unnecessary to understand all the internals of a computer. You don't need to know all that. I currently manage five technical people and their activities, and I don't understand what they do. And when they don't talk English to me I say, "If you don't start talking English to me, I am going to explain to you the inner dimensions of your self-concept." They begin to get the idea that I have some areas of expertise that they don't have and they have some areas of expertise that I don't have, but that we really can communicate with each other if we all talk English. One thing we need to do is to quit feeling intimidated when technicians start talking in their esoteric language. We have to get over that barrier of thinking they know a lot of things that are very mystical and that we have to know as well. We may have to understand some of them in order to apply them, but we don't have to know them all.

That brings me to this strange hexagon (shows hexagon on the projector). The reason I am bringing this out is to show you that we do have some barriers to face and get over--not some of you, most of you. You recognize this as the hexagonal correlation that John Holland did, in terms of his six personality types. I would suspect that if we used any instrument with a Holland code to test this audience, we would come up with a lot of codes starting with S, Social, meaning, "I love to work with people face to face and use my interpersonal skills." But people who program and put shapes together, wire their boards, and do all that stuff are right over here in Holland's category of R, Realistic; and the intercorrelation between those two types is .21. That ain't much, is it?

What that means, in practical terms, is that the interests, abilities, and values held by individuals over here in S, Social, are absolutely different from and have very little correlation with those held by people across the hexagon whose codes start with R, the technology people. This is probably precisely the reason that those of us who are in the business of trying to help counselors incorporate

technology have a difficult time with it. Sometimes my technical people spend as much as two hours on the telephone walking a counselor through the process of loading a hard disc. But that's what we are facing. So what I'm really saying is that many, maybe most, of us in this room, including myself, have a strong aversion to some degree of technology. If we are to overcome this, we are going to have to convince ourselves to learn something about this dumb machine. Because in doing that, we will produce some exponential effect that will be good for kids and good for counselors.

Now, what are some of the competencies needed for computer literacy? I think one thing that counselors need to learn is what to look for in computer-based systems. There are at least six products on the market, whose names you know, that counselors, directors of guidance, and other administrative people of all kinds need to look at and need to understand before making a decision to purchase or to use. So one thing you need to know is what systems are on the market. What are their characteristics and how do they vary in those characteristics?

Of the systems that are available, some are theoretical and some are a-theoretical, meaning that some have been definitely built upon a particular formula or a particular set of assumptions about what career guidance is and some have not. Traditionally, there have been two kinds of systems--and I hasten to say that the lines between these two kinds of systems are getting fuzzier and fuzzier. The first, which call themselves computer-based career information systems, have used the computer primarily for three functions: (1) searching large files of occupations, colleges, and so forth, by certain characteristics; (2) identifying options for students from those fi[illegible]based on those characteristics; and (3) providing usually good and accurate information about the options the computer turns up, whether those options be occupations or colleges. The second type, computer-based guidance systems, traditionally have done those things plus a couple of others. They have given major attention to self-information--specifically, interests, abilities and/or values--and to the decision-making process, whether by direct, didactic teaching of some kind, or by processing people through decision-making, but not by pounding them over the head with knowledge. Nevertheless, the system shepherds and monitors you through a decision-making process even if you, as the user, do not realize it. But because the distinctions between the two types of systems are getting fuzzier, are not as clean as they used to be, I prefer now to speak of the guidance emphasis systems versus the information emphasis systems.

So, you need to evaluate the products you look at in terms of: Which emphasis does the system have? Which do I think I need? There are prices that you pay for either. You pay a price in the guidance system for the amount of user time and the price for a hard disc versus a floppy disc.

You need also to look at the system's intent. Is it for information only? Is it for guidance and information? Or is it also for instruction in how occupations can be organized? Or how helpful decisions can be made? Or how a job may be acquired? Some systems have specific computer system instruction intentions, to teach job-seeking skills, or to teach decision-making, or whatever.

You need to take a look at the search strategies. All systems, whether information systems or guidance-emphasis systems, have search strategies. How many--one, ten, seven, six? What's the versatility? If you get yourself bombed out to zero options, can you back out of it? (laughter) Somebody has had that experience. Can you go backward in a search, can you delete variables? That would be one example of versatility. Can you use an exit function and get out of wherever you are and start over or go elsewhere, or are you lock-stepped through? What is the content of those search strategies? Is it only occupations, or does it also include financial aids, military programs, or whatever? What is the human engineering? Do you push the green key, or do you push Type I to go on, or whatever? Or do you do something else which is not very clearly communicated? Do you push down one key while you push another with your eleventh finger? (laughter) Or use your third hand to push the Control key? I mean, what is the quality of the human engineering functions? And is there a learning effect? I happen to have a bias which probably doesn't help our products in the market place, and that's about search strategies--that the student or user should be constantly informed about what the last decision did to him or her in terms of the remaining options. Look at the learning effects. Are they there or are they not there for the students in information files? What is the range of them? Different systems contain from 200 to 1,000 occupations, for example. What is the range of the information file besides? What is the recency, the accuracy, the capability for localization of, for example, employment outlook and salary? Are they capable of localizaton? How was that localization done? What are the user variables? The intended target population?

I think I must be asked a hundred times per year whether my particular product will work with inner-city youth with learning disabilities. The answer is, I don't know because I haven't tested it there, but it certainly was not developed for a student with learning disabilities. So you need to look at who the system was developed for. Some systems were developed for community college populations, some for secondary, some for adults, and so forth. What's the time required for optimal use or minimal use? Does the system store a user record or does it not? There are prices to pay there, too—if it stores the user record, it is going to take some storage space. If it doesn't store the user record, when the student comes the second time or the third time, it can't say, "Hi, John, last time you were here you did so and so. What do you want to do today?" And so there is a price to pay when you make these decisions. Either way, you need to know why you are making them and whether you are willing to pay the price.

Now, back to my counselor competencies for computer literacy. First, then, I think you need to know the products that are available. You need to be able to look at them in terms of objective criteria (I have tried to lay some of those out for you) and to compare them on the basis of those criteria. I don't see many counselors doing that, and I think it's because they don't know what areas to compare systems on, or they don't know how to do a comparative analysis. They choose systems much like students choose colleges—listening to the marketing pitch of whoever gets there first, becoming attracted to certain things about a system, but not looking at all the alternatives.

Next, I think you have to have an overview knowledge of computers, and I will tell you about as much as I think you need to know. A maxi-computer is a very large one that costs a half-million dollars or more and you never move it. It stays in one place and it can run a whole bunch of terminals—a whole bunch meaning 100 or more. A mini-computer is a small machine. You can move it. It's not any larger than one of these tables. It's usually on rollers. You wouldn't take it around in your car or on airplanes, but you could move it down the hall. It costs $30,000 to $80,000. It is capable of running up to 30 terminals simultaneously.

A microcomputer—you see many of them in this room—is transportable. Any system on the market will run on one that costs $5,000 or less. At the moment, I believe I am accurate in saying that all of the current guidance and information systems available run in only one terminal form, serving one user at a time, but

that probably in a year all systems will be capable of running on perhaps up to five terminals--some systems perhaps more than five terminals--simultaneously offered on the microcomputer. I'll lay my own prejudice on you. If I were a counselor or director of guidance today, even if my school district or college or agency had a maxi- or main-frame computer or any computer, I would try hard to get the money for a microcomputer. Why? First, because its price has become so low. In addition, having a microcomputer allows you to dedicate it totally to the guidance operation, and you don't have to contend with payroll, personnel, the administrative budget, and all the other things for priority on the machine. You are not hanging at the end of the phone line, and you are not trying to communicate with individuals who do not speak English or often don't care to--that is, the computer technology people who manage and control large main-frame computers. I don't think that's just a personal prejudice; we have products across this whole line.

The cathode ray tubes usually go with the maxi- and mini-computers. They're not capable of color. IBM's do have some color, but not the same kind of color that you're going to see on many microcomputers--very limited graphics. Teletypewriters have gone out but they're still using them in some places. On the whole, we're not communicating with teletypewriters anymore. TV monitors connected to microcomputers can give you graphics, can give you color, and can also display audiovisual things off a video disc, so that at present, perhaps the most powerful combination is the micro with TV monitors.

I think you have to know that much. You may want to go as far as getting yourself acquainted with the present situation with micros. You need to know what Apple has; you need to know what IBM has and is going to release; you need to know what Radio Shack has. I keep up with that by reading some of the journals, like PC Journal, P.C. Weekly, The Wall Street Journal for sure. AT&T is going to have an impact on us now that it has entered the computer market with its multi-user desktop computer. The computer itself, they're saying, will cost $9,000 and will run up to sixteen terminals simultaneously. It is for sure going to have impact on us, so you'd better watch AT&T.

Now another thing you've got to do, it seems to me, is to educate your management in at least two things. You should first decide what you want in terms of a computer-based guidance information system, and then get a computer that's compatible with it--instead of the opposite. What usually happens is that people

buy any old microcomputer for the lowest bid. Then they call whichever software system interests them and say, "Will your system run on the Venus 964?" And the answer is no. So what I am saying is, especially since microcomputer costs are relatively low now, you need first to decide on the system you want, and then acquire a compatible microcomputer that best delivers that system.

You have to know about software options. There is software available now in guidance and information systems for both floppy discs and hard discs. Floppy discs are 5-1/4-inch or 8-inch discs that are low cost, but they can be damaged by users if treated carelessly. A hard disc is a metallic device; the kind you would need for some systems would be ten megabytes, which means that it will hold ten million characters of data with storage. A year ago, we bought a ten-megabyte hard disc for $4,900. Yesterday I could have bought one for $2,000. The hard disc technology has had that kind of dramatic decrease in price. Hard disc technology seems certainly to be a coming trend and one that costs less and less. But you do have to make the floppy disc versus the hard disc decision.

You also need to know that rather than floppy disc or hard disc, video disc may be the wave of the future. It is totally possible today to put computer code, computer text, audio material, and visual material all on a video disc. The wave of the future may be to create updates on various computer-based information systems--new programs, new data--that can be put on a video player. If that happens, we won't need the hard discs because everything will be on a video disc, and that doesn't require a very powerful computer. The technology is there right now to do that.

As part of your computer literacy, you need to create and develop some expectations for your program. These are the things which almost 15 years of research on computer-based guidance and information systems have told us we can expect to happen:

- More specificity in personal career plans.
- Increase in knowledge about the occupations that users view at the computer terminal.
- Increase in some aspects of vocational maturity. Research in this area indicates that people are becoming more aware of the need to plan ahead and are more skilled in decision-making.

- Increase in communication with parents and significant others in terms of career planning because the computer stimulates that. Students take some printout home and sit down and say to somebody they love, "Hey, look what the computer said to me."
- Increase in career exploration by other modes--talking to people, writing away for things, reading things.
- More user satisfaction regarding computer use, the information that's available, the treatment that's being given. (I hope that's true.)

Well, then, my first point: In order to cube yourselves, you have to have certain competencies in computer literacy. I've reviewed the areas that I think are important: the systems that are available to you; their content; how the systems compare on criteria which I have described for you; some knowledge of hardware and how it differs; some knowledge of software delivery modes--floppy discs, hard discs, how they differ; some knowledge of what to expect in terms of the effects of using computer-based systems.

Commitment to a Theoretical Framework

Theme number two--the need for a theoretical position. You have to have a theory about what career guidance content you want to deliver to students. I have always committed myself to theoretical vision. You may be totally free to be eclectic; you may also be totally free to develop your own theory if you would like. But for the sake of illustration, let me use two predominant theorists as examples, John Holland and Donald Super, and say, "If you believe this theory, what should the computer do? If you believe that theory, what would a computer have to do?" You have to know what your theoretical position is, what you're trying to deliver, before you know what the computer can do for you.

Let's take John Holland. I have studied and mapped out Holland's theory. If we were to pin Holland down and say, "John, what do you want us to do for student and adult needs if we subscribe to your theory?" I think John would say that first, we'd have to know the person's personality type or code. Second, we would have to know the strength of that type, i.e., how high the profile is, how well-differentiated it is, and whether there are peaks and valleys. Third, we would have to have some way of helping the individual make a linkage from his or her personality type to occupations that are similarly coded, using Holland's occupations finder. Next, we'd

better have students collect some information about those occupations that interest them. And then, finally, we would need to help students make that transition—get a job, select a college, or get the training they need before they go to that occupation. Then I think Holland would say, "We're finished."

Now if you stop and think about those functions, what would a computer have to do to help us implement that particular theoretical position? The computer would have to be able to administer to the student, at an online terminal, some instrument that would yield a Holland code, would have to score it and interpret it. The computer would then analyze the strength of the code from the raw scores and describe the profile--whether it is high, low, differentiated or undifferentiated. It would then have to find occupations, provide occupational information, and help the person find colleges or jobs that would relate to certain choices. The computer could do all of those functions well. And in terms of the counselor/computer mix from a Holland-type position, the computer could do relatively more of those processes and steps.

Now let's go to our friend, Donald Super. Let me summarize quickly some of Super's key positions, and as I do, I want you to think about the computer doing some of those things.

According to Donald Super's current theory, people need to learn that career development is a long-term, lifelong process. Second, people need to learn a whole bunch of coping skills because if you are going to achieve vocational maturity, a la Donald Super, then you have to develop coping skills to deal with developmental tasks throughout the life-stages. Third, students need to learn that career is not a job but a combination of all the life roles that a person is playing at a given moment in time, and that there is constant interaction among those roles in terms of time and energy and commitment. Next, individuals need to understand the salience of work in their own value system. Some of us really groove on work. Work has high salience for us and is a central concept. Others work so that they can do other things, so that they have the income to do other things. As counselors, we need to take all these things into consideration as we help an individual make vocational choices over the life span. The next Super concept is that the choice of an occupation at any point in a person's life span is the implementation of self-concept. So we have to help people understand today's self-concept and tomorrow's possible self-concept, and implement that self-concept over the life span.

So now, what does my dumb computer have to do? A whole lot. If my computer is going to help me as a counselor to deliver that kind of program, it has to have tremendous capabilities; and frankly, the dumb machine can't do it all. I need a program, I need a combination of person and machine that can do some of these kinds of things now: long-term monitoring and mentoring over the life span; skill development and improvement; ability to help me understand my self-concept and translate that into my life roles, to help me decide which parts of my self-concept I choose to implement in my worker role. If I am going to implement my program according to the Super model, then I need a whole different set of things, and as the counselor, I must do some of those things. Some of those things the computer can do or can help with, but it's a whole different mode in terms of the level of counselor participation.

That's the second thing you have to do, then, in order to cube yourself--determine the theoretical position undergirding the program you are trying to deliver in terms of career guidance and career development. Once you can fix the position, then you can say, 'Who can do it? How much of it can the computer do? How much of it must the counselor do? What is the interaction between the two?"

Choice in Modes of Delivery

Theme number three--opening your mind to the possibility of a variety of modes of delivery. Since 1960 there hasn't been a lot of movement to other modes of delivering counseling beyond one-to-one. As a profession, we are still quite committed to one-to-one. But if we are going to cube ourselves and use the computer well to help ourselves do that, we are going to have to consider alternate modes of delivery.

If I were to define career guidance for you here this morning, I would say career guidance is a set of services and support systems that help an individual go through a decision-making process: becoming aware of the need to make a vocational choice, assessing self, setting goals, defining feasible alternatives, weighing those alternatives in terms of occupational choice, ultimately making a choice of highest value (which may be made again and again throughout life at different times), putting that choice into action, experiencing the consequences. At different stages in the decision-making process individuals need to access different data files at different levels of specificity. For example, at different

times I may need information about myself; very general information about the profiles and occupations available; more specific information about occupations I've identified; even more specific information about the short set of occupations I've identified; information about colleges, jobs, technical schools, military programs and so forth. This can be on computer floppy discs or hard discs, it can be in books, it can be in people, it can be on paper, it can be on microfilm or microfiche. But at the different steps in the process, I must go to data files of different levels of specificity that are stored in different forms.

Now, I think there are at least six modes of delivery that we can use to support this process in human beings: one-to-one, computer, curriculum, group, workshop, and self-help materials. The minimal components of career guidance are helping people to acquire readiness for it, to acquire self-information, to make the linkage between self-information and occupational options, to get occupational information, to do some reality testing, and to implement choices. If you can accept those at least as baseline components, then you can move to modes of delivery. Readiness could be done well in group sessions. Self-information could be done well in all five modes, and so we might select which combination of modes we want. The linkage could very well be done by computer or by carefully constructed paper charts. Occupational information could be done well by computer or by all kinds of reference books and printed materials. Counselors could really be helpful in the narrowing, reality-testing stage by helping people evaluate alternatives and bounce them off against each other; this could be accomplished in a group workshop approach. Implementation plans, meaning finding a college, finding a technical school, finding a job—the computer could certainly do that kind of searching and matching function very well.

Now, there are multiple, multiple combinations. One program I know of uses one-to-one for self-information, sends people to the computer for the linkage between self-information and occupations and for occupational information, brings them back to one-to-one counseling for the narrowing process and the weighing of alternatives, and then uses the computer to find modes to implement career planning. Another model starts with group process for readiness; printed self-help materials for measuring interests, abilities and values; the computer for the linkage with occupational information; group discussion for the narrowing process; and the computer for the implementation stage. And there are many other models.

Where Are We Now?

Let me close by telling you where I think we are in terms of career guidance and career information systems. First, all of them are well-supported, easily available, and run on commonly available machines. Present-day systems are targeted primarily for secondary and postsecondary levels with two systems emerging now that are targeted for adults.

Second, I think we have done a good job in the last 15 years of harnessing the computer for these kinds of functions: for data file storage and retrieval; for searching large files by characteristics selected by the user; for computer-assisted instruction in the guidance areas such as values clarification, decision-making, occupational organization, learning how to get a job, learning how to select a college; and for scoring interest inventories, values inventories, and self-regulatory inventories, and interpreting them online. I think we're at the stage of being able to deliver good services through career information guidance systems in the $2 to $4 range per hour. It may be that we are delivering services with some software with some machines for less than $2 an hour—and when I figure $2 an hour, I write a machine off in three years because it's going to be obsolete in three years. That's where I think we are.

Where Are We Going?

Where do I think we're going? I should warn you that I was predicting some of these things in the late '60s which are now becoming true in 1984.

First, we're moving to systems which reach new populations. Two major developers currently are designing systems specifically for adults who are trying to make mid-life career changes and choices. Second, I think I'm the only developer at the moment with a system for business and industry. This system is specifically designed to help individuals within a large organization plan their career ladders and their progression within the organization. Next, I think we may see systems developed for lower grades, for middle school. There is no system currently designed specifically for the middle school years. We certainly need also to see systems developed for people planning retirement—for planning at that end of the life span. So I think we will see new populations.

We're also going to see new places. We already have systems now for military populations. When we get adult systems working, we'll probably put them in

libraries and community learning centers, and then into the homes. That will occur via either the home computer or through networks. When this happens, we'll be faced with professional questions about counselor support--how do we recommend people for counselor support? We'll have to make some hard decisions about our profession and how we manage the counselor role and what we're going to do about that.

Next, I see systems becoming more beautiful in the sense that we can now enhance them with powerful graphics and powerful combinations of color. In our office we've acquired a product that cost us $200 called "Display Manager," and now any screen we produce can have any combination of 16 background colors, 16 foreground colors, and 11 different border colors. As these things become available, we can make systems more and more attractive and appealing to users. The video disc is at a stage where it may fail or may succeed in guidance as a tool, but the video disc can enhance computer-based systems. Under computer control, the video disc can show students work tasks and work settings of occupations on a second screen or on the same screen with the text, or can show them what college campuses look like. A present production, the World of Work Map, shows what occupations look like all over the map—an audiovisual production of sampling the world of work all over the country. So we will have the capability of commandeering audio and visual material off of the randomly accessed video disc.

I also see us getting more and more power for fewer and fewer dollars. I gave you the hard disc illustration—we paid $4,900 for a hard disc about 18 months ago; now I could buy it for $2,000. The IBM Personal Computer was almost $6,000 when it first came out--it's now available for about $3,500. So we're seeing more power for less money.

Next, we'll see multi-user systems. The current kind of networking that is available does not have what is called user record lockout. Today, if you are doing some kind of computer systems instruction where you are not keeping track of what each user is doing or a personal record for each user, multi-user on micros is already possible. But if you want to keep a record for each user at the terminal, and want to keep each of those records separate, that is not possible at this moment. Developments are happening rapidly there, however. Soon you may be able to run around with your PC and plug it into any telephone outlet and operate it off the telephone outlet. And soon we will have record lockouts so that records and

files don't get mixed up from one user to another. We may also see voice command. Texas Instruments recently introduced a machine that will recognize voices and can be programmed by voices. So in the next five years, instead of pushing the F1 button or typing "1" or pressing "Enter," a student may just have to say "Giddy-up!" or "Go backward," or "Take me back to the directory," or "Shut up," or "Sign off," or whatever.

Last, I think that we will undoubtedly have access to larger and larger data files; we will get more and more storage capability on hard discs for fewer and fewer dollars. Here's an example. All computer-based guidance information systems have college search programs available. Right now they just search the files, come up with a list of colleges that meet your characteristics, and give you some information about them. But imagine being able to link into ACT's huge data files which are currently resident on a large mainframe in Iowa City--suppose they were transferred onto a hard disc or could be accessed by phone line connection. Then, besides learning about five colleges, students could also tap into the experience bank that reveals what happened to students like them in each college in relation to their test scores and their grade point average in high school, and so forth. Students would have a whole lot more information to use. We may see that kind of movement becoming financially feasible.

I'm going to stop now. Let me summarize again by saying that you can put an exponent next to your name, you can at least cube your power, with the wise use of technology. But in order to use technology wisely, you need some basic kind of computer literacy--my first C. Then you need to commit yourself--my second C--to some theoretical position, either someone else's or your own eclecticism, so you know what it is you're trying to deliver, what the computer does, what the human must do. The third C--I think you have to be flexible in your choice of a model of delivery which includes one-to-one, computer, group modes, paper modes--and integrate those delivery modes for the highest power you can achieve.

Thank you very much.

NEW DIRECTIONS AND DEVELOPMENTS IN NIE AND DIP

Laurabeth H. Hicks

Greetings from NIE/ED and DIP. I am so pleased to have been invited to participate in this significant, timely workshop. I congratulate you for convening "The C^3 Experience: Counseling, Computers and Creative Change." Besides providing me an opportunity to share information about what's new in NIE and the program that I direct, this is like "ole homecoming" to me. It brings me in close contact with professional colleagues and friends whom I have known and worked with over the years.

In my conversations with Garry about my participation, he expressed his desire to have me share some information and comments on "New Directions and Developments in NIE and in Dissemination and Improvement of Practice Program," of which I am the Associate Director--DIP as we refer to it in the agency.

The general focus of much of NIE's energy these days is on devising innovative ways of communicating the results from NIE-sponsored research to an expanded practitioner audience. The hope is that these educators will use this knowledge to revitalize our classrooms throughout our nation.

All of our planning activities for FY '84 and FY '85 focus on the theme, "Strengthening America's Classrooms" and, more specifically, on improving the use of technology and software in the classroom and in helping teachers and schools be more effective.

In keeping with NIE's theme and the specific areas of emphasis just outlined, much of our research funding, if approved, will be on technology in schools and ways of improving teacher effectiveness. DIP has a major responsibility for the management of information, which includes telecommunication and electronic networks in districts, states and local areas.

The remainder of my comments on NIE's and DIP's new directions and developments will be confined to these five areas:

1. Getting results of NIE-funded research to educational practitioners in the classrooms.

2. Laboratories and centers.

3. DIP leadership in the development of a new comprehensive dissemination plan for NIE.

4. Update on some new activities and practices.

5. Counseling and guidance independent initiative.

Getting the Word Out

Getting the word out around NIE means using creative ways of sharing research knowledge in a usable form with NIE publics.

To increase the likelihood of reaching a broader audience of constituents, NIE has a writer's group that develops, in cooperation with NIE researchers, a one-page brief that is circulated to a very broad base of educational decision makers, whom we want to be acquainted with the results and who will, hopefully, use or recommend the use of the information for improving the quality of the learning experience in the classroom.

In this connection, we would be pleased to have you assist us further in "getting out the word" to individuals in networks represented by you through any of your dissemination mechanisms.

We are interested in any success stories on the use being made of funded research to improve educational practice. We would be pleased to know of any creative ways that you have found to be successful in disseminating NIE-funded research knowledge to a large audience of educational practitioners, and how or whether they used the information for improving teaching and learning.

Laboratories and Centers

A major part of NIE's and DIP's new directions and developments relates to preparation for labs and centers competition.

In the press release of July 14, 1984, on labs and centers, the Secretary announced planning missions and geographic regions for the network of educational research labs and centers and described the upcoming competition as the largest discretionary grant competition ever conducted by the Department of Education, and for the first time in almost 20 years, <u>all</u> parts of the U.S.A. will receive full services from the research laboratories. According to our director, the competition will involve awards totaling $150 million to the selected centers and labs between 1985 and 1990.

The Secretary's ten regions were announced. Two centers will concentrate on the effectiveness of elementary and secondary schools; two will focus on effective teaching; one will examine recruitment, retention, inservice training, working conditions, career policies and incentives (like merit pay and master teacher plans). Another looks at ways of attracting quality teacher candidates, reform of teacher education programs, and establishment of collaboration between schools and universities to improve teacher education. One center will be devoted to state and local leadership in education, and another will provide information on how the private sector can become more involved in educational improvement.

DIP has a lead role in coordinating activities for the laboratory competition. The lead responsibility is a natural for DIP, since the regional program is part of DIP and it has a concentration of laboratory institutional monitors. The other two DIP programs are information resources and research and educational practice.

A Plan for a New Comprehensive Dissemination System

DIP has a mandate from the director of NIE to develop a comprehensive plan for a new dissemination system in NIE by September 1984. My program, DIP, has entered into this major task with a great amount of enthusiasm.

In the six months, more or less, that I have been a senior executive of the DIP staff, I can truly say that DIP staff is in the middle of any major NIE action designed to improve our classrooms. Major activities being carried out as part of the comprehensive dissemination plan include:

1. Setting up a national study group on improvement of practice.
2. Providing leadership in both the creation and management of telecommunications and electronics networks to facilitate the linkage of DIP/NIE to other major field agencies engaged in NIE-sponsored efforts to improve education practices.
3. Setting up an electronic mail system for labs and centers to facilitate better collaboration and dissemination.
4. Involving a senior scholar-in-residence in the study group steering committee and in an advisory role to DIP.

Just recently, we conducted one of two dissemination workshops that brought together researchers who have investigated dissemination practices designed to

improve educational practices, senior staff from NIE and the ED, and association representatives. The summary of the content of this workshop will help DIP arrive at decisions in the dissemination plan. The second workshop will build on the outcomes of the first workshop.

In July or August of this year the national study group will hold its first of three or four meetings. By that time we will be in a better position to use this study group as a sounding board for some of our planning ideas that are beginning to crystallize, engage their assistance for getting out information on research results to NIE constituents, and get suggestions on needs which NIE-funded research might meet.

Our dissemination planning activities will be stepped up even more in the days and weeks ahead, in order to meet timelines for submitting our plan to the director.

Some New Directions in ERIC

Here are a few tidbits of new directions and developments which Chuck Hoover (Mr. ERIC) thought I should tell you about:

1. The National Education Practice File (NEPF) is a two-year, NIE-funded project designed to collect materials and develop a computerized file of information which will meet specific needs of teachers and administrators in their day-to-day operation of schools. All ERIC centers cooperated in selecting the search sites for this project. The sites are:
   - Iowa Department of Public Instruction, Des Moines, Iowa
   - San Mateo County Office of Education, San Mateo, California
   - New York City Teachers Centers Consortium, New York, New York
   - Social Science Education Consortium, Boulder, Colorado

   Over 14,000 already existing ERIC documents are tagged as being practitioner oriented.
2. ERIC Digest Clearinghouses are producing two-page syntheses of information on topics of current interest to educators. In addition to the text, which is informative but not too academic or colloquial, the digests contain a list of references for more in-depth information on the topic.
3. A Japanese thesaurus--ERIC recently received complimentary copies of a Japanese version of ERIC's Thesaurus of ERIC Descriptors.

My time is running out, but I want to close by telling you about an independent initiative of mine to "get the word out" about research and study results that help to clarify the role of career development/counseling and guidance in improving education practices. I want to share this kind of information with a wide decision-making and practitioner audience--help me get the word out. Please share those results with me and constituents in your nets; flag the results that are outstanding and I will make it available to others who need a clearer picture of what key educators, like yourselves, do to revitalize classrooms and educational practices in and out of classrooms. Again--I congratulate you on this significant conference and will spread the word about your accomplishments!

SYNERGIZING COUNSELING AND HUMAN SERVICES

Clayton Lafferty

Garry: I first came to Michigan in 1961 and as a young faculty member I soon developed responsibility for developing NDEA Institutes. These were year-long institutes in which you had to put together a faculty, and the challenge was always: Was there someone you could bring who was creative and different and would be a real stimulus to the group? So, as a new faculty member, I asked around, "Who's different, who would really get this group going and put them into orbit?" The name I heard many, many times was Dr. Clay Lafferty. So, I invited him to come out and speak to my institute. He was all that everybody said he was. He was provocative. He was unconventional. He was stimulating. And he was invited back as many times as we had an opening.

The thing I remember most about Clay is not his teaching, however stimulating it was. After our last session, he and I went out and had a martini together. And as our relationship developed and the warmth of our conversation increased, I said, "Clay, you look like you're on the roll to me. Where are you taking your life?" I've never known anyone to speak so directly to their life goals. He said, "Within ten years I want to own my own corporation. I want to have a twin-engine plane that I will fly around the world. I want to be an international consultant who works not just in education, but business, industry, and all aspects of human resources. I want to have enough time to pursue the arts, to take pictures, to travel, and I'd like to somehow establish a major research organization." Would you believe ten years later he has done all of those things. He is now Chairman of the Board of one of the fastest growing professional consulting organizations in the United States, called Human Synergistics. He does have a twin-engine plane which he flies around. For the last two weeks, as an example, he has been giving speeches around the United States to superintendents and to CEO's in business and industry. In fact, when he was introduced recently, somebody who didn't know him was insensitive enough to take his full vita and read it. His vita now has a little sign on it that says, "Please do not read my vita." So I'd like to introduce you to a man who not only talks about synergism and who founded a company which is devoted to bringing about synergism, but is himself a living example of human synergism--Dr. Clay Lafferty.

Clay: I was once invited back to The University of Michigan a couple of years after I graduated, and my opening remark to the graduate students was, "It took me two years to get over the nonsense I learned in this program, and I hope to God that your recovery is faster than mine." A real penalty. I've not changed my mind. As you can see, remarks like that have a way of wearing out your welcome.

It's been a long time since I heard the comment, "Garbage in, garbage out." And I don't, for a moment, pretend to know what's happening in all spheres of education, but I'm very much afraid from what I see happening in the human resources field. To be blunt about it, we're going to take the same old crap and put it on high technology equipment. And we're going to emerge 20 years later with all the impact on education that the math-science scare had 20 years ago. We are desperately in need of some new concepts. Let me go back, because those were not just selfish goals I shared with Garry. I think he left one out--I have a lot more time available to love.

I think it's always fair to know where a speaker is coming from. So that you know my biases up front, let me try and share a little bit about my own professional history. Not stuff you generally hear. I spent an early two years of my professional career working in prisons. You don't have to be there very long to recognize that if one of the major causes of criminal acts against society is that people hate themselves and blame themselves, there isn't a prayer that our current penal system is going to reverse any of that. So I suggest to people, if you ever play the game of treasure hunt or something and you have to find 500 self-blaming people, you could take any prison sample and be reasonably certain that, by and large, they hate themselves. One of the things we're going to have to learn is that throwing people in the slammer for 10 years and convincing them that they were right in the first place, that they are rotten, hardly relates to whether or not people change those behaviors.

From there I went to work for the Wayne County Board of Education. There is nothing in my education that prepared me for what the Director of Psychological Services for 400,000 kids might do. So I ordered a Bender. I thought maybe I ought to have two sets of Rorschachs because I sure was going to wear them out fast. I had a marvelous old educator as boss, Charley Brae, who lives on because a few schools have his name on them. Charley saw my order for the typical tools of a psychologist and said, "How many kids do we have in Wayne County? How long do

you think it's going to take you to test all the kids out there?" That was my second day on the job. I realized there was something seriously deficient in how I had thought about the job. The Deputy Superintendent sat down one day and said, "How would you know in a year from now whether or not what you did made any difference?" Being a young psychologist, I started to rattle off at the mouth like nobody's business about how you could really evaluate whether you had done anything or not. What I didn't notice was that Bill was writing like mad. When he finished, he handed me back the piece of paper and said, "It looks like those are your objectives for the year." The biggest trap I had ever fallen into in my life.

I used to think you could walk through a school and you'd find no evidence that John Doe had ever lived, no evidence that anything had ever taken place in research. A marvelous team, Bill Morse out of the School of Education here, Dick Cutler from the Psychology Department, and a couple of other folks were assigned one time to work with five of the worst school districts in the State of Michigan. They were nominated by the Department of Public Instruction, and the question was "What would happen if you really set up in-depth consulting work?" The problems we ran into are not the kind of textbook problems that we write about. In one school district, the teacher contracts were all locked up in the safe because none of the teachers trusted each other enough to assume somebody wouldn't break the line. When I said, "What is the distribution of teachers on the salary schedule?" the superintendent told me, "Nobody was on the first deck yet." The second problem was that the superintendent's wife was teaching a course for gifted kids because that was the best group of kids in the school, theoretically. I won't bore you with all of that, but the report we wrote on what was wrong with those schools once leaked publicly and we did everything we could to get it back because we would have all been in court. It looked like small Peyton Places all over the place.

We wondered what would happen if you put five or six of these fairly experienced team members into one of the best elementary schools you could find. What would happen if we made a concerted effort to change teachers, kids, and the way the administration looked at them. That was the subject of my own doctoral dissertation, and what we showed was massive change all over the place. We taught some unusual things. For example, we taught kids in the first, second, and third grade to deal with an insane teacher. There wasn't any other way to handle that kind of reality. He or she was going to be there. You have no idea of the impact

that a group of second grade kids who think reasonably rationally can have on a screwy teacher. You hear second grade kids say, "How long have you felt this way, Ms. Smith?" Most of that stuff was on tape and it's aging now, but what the program showed is that it is possible to show massive change in elementary kids in the way they think. They can learn—despite every assumption by education that they can't and despite every evidence in our behavior that says, "We don't even think they will change." If I gave you $100 for every teacher you knew who measured his or her class pre and post because he or she thought it was important, I am sure I have enough in my wallet tonight to pay you off. When we don't bother to measure pre and post, the assumption is people don't change. And we simply don't want to be embarrassed by bad results. One of the subtlest assumptions all across the country is, "What do you mean education changes people." Nobody expects it to; even educators don't act as if that were true.

I just attended a huge conference in Dallas. All the retired teachers are now showing up in the field called human resources and we're going to see the same old garbage with tremendous needs to educate a population more effectively. I can tell you that after lots of managerial development programs, lots of insight and technical training programs, the assumption in that field is that people don't change. It's like everybody has taken an introductory course in Sigmund Freud and assumes that you're now screwed up because of your third birthday events. My own hypotnesis is that if Freud were alive today, he would be far too intelligent to be a Freudian. As a matter of fact, he did give that stuff up near the end of his life. Let me share with you my favorite quote from Sigmund Freud: "The most significant way you can change a piece of behavior is to change your point of view." Sigmund Freud never thought anybody would get better as a result of psychoanalysis. That's not what it was for. That was just to figure out how people got sick. And if you got better as a result that was a happy accident. So I wonder why we have thousands of psychiatrists across the country practicing psychoanalytic techniques. Freud himself would be horrified.

If you're not familiar with it, Freud's theory of psycho-social development was that people got hung up in various stages of their psycho-sexual development and therefore replayed events throughout their lives. Jules Masterman once said that the problem with psychiatry, and hence all of our disciplines, is that it's hung up in various stages of Freud's development. Some of those people have never read

beyond his first book. So there's an army of people out there using ventilation. I watched a disaster nationally not too long ago--somebody of an analytic background decided it would really be helpful if all the Volkswagon of America dealers got together, and, since they were very ticked off at the manufacturer, why don't we allow them a ventilation session. So they ventilated all over the place in a national meeting. They thought that was terrific. It worked so well they came back the second year and decided to have another one. But the first comment from the audience was, "This is pointless because we told you last year what was wrong and you didn't do anything about it." You may <u>feel</u> better with ventilation, but you don't <u>get</u> any better.

So much for my career in education. I left about 1963 with a very depressing idea, that education was probably not going to get better in my lifetime. If anything, it was getting progressively worse. And so I had a personal decision to make and that was about the time I talked with Garry. What I decided was not to do anything I didn't want to do again and to make a sizeable contribution of some sort, to become reasonably wealthy in the process, to enjoy my own life style, and to work with people who wanted to be worked with, a recommendation Warren Ketchum gave me originally. He said if you spend your time working with people who want to be worked with, you live a reasonably happy life. My general approach with people who don't want to change is, "To hell with you, then." Life is short. I have on occasions told seminars to go home. "Get out of here. I'll give you back your money. You people are dead." It came as a surprise recently to the key management of a major public accounting firm when we cancelled the seminar at the end of four hours on the first day, because they were dead. They had no inquiring minds. They were caught up in conventionality and, just before we dismissed it, one guy said, "You think this meeting is dead?" And I said, "Yeah, you folks died a long time ago. You're still walking around but..." And he said, "My God, if you think this is bad, you ought to be in our staff meetings." He, as you would guess, earned quite a reputation in that company. If you don't want to seriously work on some change, then please don't take our time and we won't charge anything to learn nothing at all.

The year was 1968 and things were really coming apart. So I deliberately sat down and wondered who in the world was going to apply the good ideas from education, that people can change, that the basic stuff is not the three R's. It's how

people feel about themselves and what they do with what they feel. It is imagination that makes knowledge come alive, and it is respect for yourself that makes you able to use it. (I hope we don't lose all that in our excitement about computers, because a computer is never going to lean over and kiss you on the forehead. It just ain't going to do that.) I decided to tackle the largest companies in the country and show them that people do generally want to be effective. And that a lousy manager can screw up more people in a short period of time than you can shake a stick at—just as we have massive and overwhelming data that a sick teacher in a classroom in less than six weeks can produce a significant rise in disturbance in the kids. But isn't it a paradox in education, despite all the focus on excellence or the attempt to look at exemplary practices, that we have studied the impact of sick people on kids. But I do not know of a single study that would say, "What would happen if we studied that one kid out of 100,000 who wound up with a kindergarten teacher who was alive and excited and interested and then, by accident, got a first grade teacher who was the same way, and then, odds of all odds, wound up with third and fourth grade teachers who might be healthy and enthusiastic, and by God, even got through the fifth and sixth with somebody who was reasonable?" The question might be, "Would a group of youngsters exposed to healthy, excited, interested human beings look healthier at the end of the sixth grade than kids exposed to what our general teaching populations look like in our measures?" I would say that the prevailing atmosphere in the classrooms is that too many teachers believe their sense of worth, dignity, self-esteem relates to who approves of them, not to an identification with their subject matter or a sense of excitement. That's a prevailing style for teachers. It's not achievement. It's not self-actualization. It's not a sense of humanism. I can show data that say that the average foreman at Ford Motor Company is more interested in the development of people than the average teacher in the classroom. That's not an opinion. I would be glad to show you a highly significant difference in how they even think about themselves. So the paradox is we've got some pretty healthy people building cars and, by and large, it's a pretty sick one that's teaching kids.

Sickness in this context isn't a neurosis. It says if my sense of worth depends on approval, I'm likely to manage the classroom the same way. I'd love to see one of you take a program that takes the idea, "What is it that determines human worth?" and spend a little bit of time on it. What we now teach is quite sick. My

data say 55% of the kids in the fifth grade believe their sense of worth, dignity and self-esteem relate to the grades they receive. We keep messing around with whether the grade ought to be ones, twos, threes, A's, B's, C's, or Needs Improvement. We mess around with administrative procedures, but no conceptual difference. I would like to see a teacher say, "You received a 'D' in geography. All it means is that you don't know geography, and nobody ever died from that." If you want to play around with geography, I could tell you it's at least as exciting as Trivial Pursuit. I'd love to see algebra presented from the point of view one professor did at Columbia, that learning algebra has about as much significance as learning how to play Monopoly. He took a group of kids who had flunked algebra the first time, took them back through Algebra II and said, "Hey, it's no big deal. If you want to play Monopoly, that's great. If you want to play algebra, let's pay attention to that. It's a game. It's a way of figuring out unknowns. But I can't for the life of me figure out how anybody earns their living knowing algebra. In my whole life, I've only met one person who earned his living knowing algebra. But it's a great game. Marvelous way for figuring out things you don't know." And what that particular professor taught (one of the things that ought to be disseminated) the kids learned--just by saying it might be fun.

Do we really believe a person's sense of worth, dignity, self-esteem relate to the grade they receive? If so, one of you ought to develop a program in your computer somewhere and some software saying, "One of the most important things you need to learn about school is do not get your sense of worth caught up with how the school evaluates you. That is the school's particular form of insanity. One of the greatest educational opportunities you have here is how not to take a group of people who behave in sometimes very unsane ways too seriously." Think of the disaster we would have had if every student we had ever taught through all the centuries had learned everything we had ever taught them. Can you imagine the trouble we would be in?

It's a good thing that a lot of the kids do not learn what we teach them in the classroom. Would it surprise you as counselors to know that I could make a case for a GPA of 3.85 as a good predictor for schizophrenia, as good as it is for performance? Would it surprise you if I told you in my own sample of presidents, over 90% have reported a year to three years of failure in high school or college, and that the hallmark of a good manager is failure in high school or college. Because

their own goals were just as important as the stuff we lay in front of them. Anybody who is trying to raise funds for college will tell you they don't go to their straight "A" students.

I teach college recruiters simple diagnostics. Students who get a 3.85, by all means, congratulate them. Then ask a question, "Why did you do that? Why was that important?" If the student says, "To tell you the truth, the 3.85 didn't mean anything; I fell in love with physics and there wasn't any problem," hire him on the spot. If the person did it for any other reason, you'd better go on to your next interview.

We're short on concepts all over the place. As I said twice before, if we program the computer with the same stuff we now have, we're going to see massive kinds of disappointments. Let me take you back to something that I think is rather basic. We need to have some idea about what the core driving phenomena might be in human beings. From that point of view, I'm a Sullivanian. I believe that the thing that motivates most human beings is the maintenance of self-esteem. Let me just give you an illustration of how easy it is to attack self-esteem in a human being—and all of the nasty things that can happen as a result. And if you can attack it as easily as I will in just a couple of minutes, then it's quite possible to learn some ways of building it. And we're going to build it, I think, with the marvelous technology that we have in front of us, with truly interactive programs. But those programs are all going to have to be driven by a description, and they're going to have to be driven by diagnostic approaches.

At this point, what we know about the development of the normal, healthy human being is limited. We can't even describe it accurately. One of the first things my company tried to do in 1971 was to build a system that was comprehensive and, unlike the old psychological procedures, would never go to anybody but the person being assessed. Because they are, in the last analysis, the only persons that can change themselves anyway. A psychological report sitting in a personnel office or in the counselor's file is useless. When I think of the tons of information the schools have generated and the small amount of behavior that is changed as a result, I think the testing companies and the paper companies did very well. But the kids didn't do so hot.

Tests are seen by most people as a threat. We're very much indebted to the original thinking of Timothy Leary who is now very much discredited. Back in the

early 1960's, Tim did a yeoman's job. If you're not familiar with it, you should be. It is a multi-level way of describing how people function. Let me take two minutes to describe that, and what its computer capabilities look like on the other end.

We can ask you to describe yourself on ten or twelve variables and encourage you to get feedback on exactly the same kind of variables from other people who have known you relatively intimately. We have two kinds of measurement with 12 possible variations. We're now looking at 144 possible combinations in how people look at things. I can tell you the discrepancy between those measures is extremely important. Say you describe yourself as very friendly and amicable, clean, cooperative, synergistic, whatever. (Synergistic, incidentally, is the Greek word that means exactly the same thing as cooperation. Syn, with, and ergi, work, simply means to work with, that's all.) If you thought you were friendly but nobody else did, we wouldn't attack your general motivation, except to say, "Well, you look very much like a closet friendly, but you keep this stuff beautifully hidden. And the odds are also very high that you have no real skills in expressing what your original intentions were." That's our business, isn't it, developing those skills? Somehow it never dawned on anybody that those problems might exist right down to kindergarten. A lot of kids really like their parents. They don't know what to do with that. And parents don't know what to do with the fact they like their kids. If parents were upset about their kid not being able to read, my favorite question for them used to be, "Supposing I told you before you had this youngster, when you were pregnant, that this kid wouldn't be able to read, would you have had an abortion?" Most parents are absolutely shocked by such language. "Certainly not!" I said, "Then why are you treating him as if you wish you had?" If you could change that kind of orientation toward failure, you could relieve an enormous amount of pressure.

Let me go back to my illustration of how easy it is to attack self-esteem. You're a large audience, so what I'd like to do is to select maybe one person at each table for just a minute or two. When I give you a signal, simply stand up and introduce yourself to the rest of the people at the table again, but this time I'd like you to share with those people at the table one or two of the most significant things you can think of about yourself. What separates you, makes you unique and different from other people? I'll give you a minute to think about that, and let's see what happens. Just think about it, don't act on it. And just so it's a random sample,

let's pick on the person at your table who has red or blue on. That should make it reasonably random. If there are more than one shade, let's get the brightest shade of red or blue.

Okay, if I could have your attention for just a second. That changes the tenor of the room doesn't it? Think back to what happened when I said I'd like you to stand up and introduce yourself. Let's say we had a closed circuit video camera focused on you just a few minutes ago and we could do an instant replay back for your benefit. What happened when I said stand up and introduce yourself and tell those marvelous people at the table just who you are? If you were watching yourself, do you think you would have seen a sharp change in facial expressions? What was a very pleasant banquet suddenly looked more like a lynch mob. An amazing number of you rapidly folded your arms as if to say to me a hundred feet away, "Yeah?" There was like a wave moving backwards from me. You all increased your distance just slightly from where I was. One lady in a marvelous white dress and a red blouse covered up the red blouse. White was neutral. Red was bad news. The other thing you could have seen is almost all of you were looking at me when I started that sentence; and, by the time I finished, there was an instant loss of eye contact. The significant portion of you fell in love with the ceiling; but a number had an affair with the carpet.

Kids know that as early as the third grade--"Good morning children. Who discovered America?" You can almost guess the kid's religious belief by which direction he looks. "Help cometh from above...Not this morning, Billy." Imagine the things we could have measured physiologically in this simple little experiment. I can tell you over 35 different things would have been impacted with that sentence--except for about 15% of you who are probably pretty healthy human beings and would be looking forward to standing up and doing that. Maslow thought 15% of a population might get through being raised and educated and remain healthy. But what he said in his own private journals to himself was that he actually thought it was less than ½ of a percent. One-half a person out of every 100 who might really be a healthy human being. We can't even imagine what in the world that looks like. I can understand why he took the position of 15%. He was lynched for that! Imagine what would have happened if he wrote "It takes 200 people to get one that looks pretty good."

I can imagine that your heart beat went up a little bit, that your perspiration increased a little bit, and for some of us, deodorant failure was complete, wiped right out. You might have seen some change in digestion, so that lovely dinner you had became a leaden soggy mass. Your shot of adrenalin probably increased. I won't go through that entire list, but it would be fascinating--everything from alpha waves to digestion. If I said to you, what I would like you to do in the next 30 seconds is to please concentrate for a moment. I would like you to reduce the temperature at your temples and raise it across your wrists by about 2°. I would like you to slow down your digestion by about 20%. I would like you to increase the pressure on just the left side of your body on the arterial walls. I would like you to perspire only on the right side but not the left. You've got 15 seconds to get going on that. Most people would tell you they couldn't do that. I'd say, "Don't get foolish. You just did." I once asked Earl Kelly (whom some of you probably know) over two bourbons (I get great answers out of educators or anybody else with a couple of bourbons), "Earl, if you could push one button all across the country and make something happen in classrooms, what would you do?" Earl thought for a while and in his usual salty way said, "I think I would lace all the teachers' coffee first thing in the morning with thorazine so they had a little perspective on what was going on in the classrooms, and didn't take things so seriously." Someone else sitting in the same meeting said he would lock up all the textbooks until January, and the teachers would simply have to confront the kids from September to January. If that went well and the teachers survived, they could have the textbooks.

For a sophisticated group like yourselves, a simple request to stand up and introduce yourselves is a slight threat. Right? What did you experience? A mild increase in anxiety. Why we haven't figured out that that's what knocks out a lot of learning, I'll never figure out. We seem to focus on everything but that.

If I could take the time tonight, I'd ask you all to talk to each other about five minutes and give me your best definition on what you think quality in thinking looks like. What do you think happened to the quality and to the quantity of human thought when you thought you had to stand up and introduce yourself. Was it clear, precise, to the point? For most people, it was probably disorganized, not very clear. The rate of recovery was very low. When you increase anxiety for people, thinking goes down the chute, especially in complicated things. You, at one time or

another, have probably been familiar with Wechsler's digit span test. I say some numbers and you repeat them back to me. I wonder what you would all have looked like tonight if I had said, "I want you to stand up and introduce yourselves but before you do I want to give you a six-digit telephone number forward. I would like you to remember that and please give it back to me when you get done introducing yourself. And please understand that is only normal intelligence. If you can't do that, you're going to go into a special class." I think we would have concluded that, despite Garry's great input on the success of this seminar, we are looking at some folks that function on a semi-retarded level. Not only could you not remember the telephone number, but you forgot your last name! I don't think that most of you in blue and red suddenly felt an increase in compassion for other people around you. If you had red on, I don't think you looked at the other person in red and said, "I feel sorry for her." I think awareness evaporated and I think you said to yourself--sorry about that but I've got my own problems. I suspect most of you would not be very impressed with your access to memory under those circumstances. Isn't it about time we made a connection between the fact that anxiety, fear, or anything beyond interest and tension and excitement about a task diminishes human performance? Why we haven't been more clear on that in education, I don't know.

Let me give you some results in industry. A struggling little outfit that was partially responsible for some of the stuff you were playing with the last couple of days, a little outfit down in Dallas called Texas Instruments, did a study back in 1963 (that's how new it is) about the usual lag in dissemination of research information. One of the things they looked at was what would happen if you brought workers into a plant under conditions of high anxiety versus low anxiety. High anxiety was the normal hiring procedure. TI took a group of 100 people and focused on the reduction of anxiety in the workplace. They told them, "90% of the people we hire learn these jobs. If you can't learn that job, we'll transfer you to one that you can learn. Learning spans anywhere from six weeks to six months. There's nothing wrong with taking six months to learn that job." They followed that group up and found that the control group ran 27 units per hour and the experimental group ran 92, a 240% increase in productivity. Absenteeism was cut in half. Tardiness reduced to 1/5. And most significant, the number of hours to reach a predefined level of competence, previously 385 hours in training, reduced to 225.

Let me tell you what I think the incredible shame is. We've had ideas like that in education. We haven't bothered to research them. We research Mickey Mouse administrative techniques that even if they worked don't amount to a hill of beans one way or another. That study should have been done in an elementary school. What would happen if we brought some kids in and deliberately reduced the anxiety about learning? It should have been done in a university, not a computer manufacturing company. It should have been the subject of a half dozen doctoral dissertations out of this university. Supposing I asked you to give me a one sentence explanation as to why you experienced anxiety a few minutes ago. If you're like any other group I've ever worked with and I suspect that you are, 90% of the people in the room could not come within a country mile of explaining the causative factors of what just took place. And if we don't understand the causative factors, then we don't have a prayer of changing them. Most of us would explain it in a technique we've learned in classrooms a long time ago and that is the stimulus-response. It was my invitation to stand up and introduce yourselves that produced the anxiety. I can't believe that anybody is still serious about that kind of research, and yet that characterizes, in my informal estimation, 80% of the research done in this field. We keep looking for the stimulus that produces the difference. Stimulus-response theory. I can tell you that you can go through the Encyclopedia of Educational Research and you wouldn't find enough articles to get excited about that predict anything.

Let me take an illustration. In the stress field recently, you've seen lists of things in magazines that say if you have been through a divorce, promotion, kids leaving home, increase in traffic tickets, spouse who's left you, or a spouse has died, then you accumulate stress points. And if you accumulate more than 3300 of those stress points, you get sick within a year. Not a bad study. The correlation is only a .29. The significance is about .001 because it is a significant finding. But I tell you, a .29 gives you a predictability for five cases clinically. When you deal with real people, you're going to be wrong four out of five times. So what are we talking about? Don't we know that if somebody has a high value system for people in a close relationship, when it is lost it is a devastating event for people? If my own drive is toward career development and I don't care very much for people, then the death of a spouse isn't going to be that upsetting. And the death of a spouse is not going to be very upsetting for an awful lot of people if the relationship wasn't

any good. And apparently it isn't very good for at least half of the couples because they manage to divorce each other sooner or later.

What research is starting to pay some attention to is it's about time we measured how human beings think. So if you would like my own substitute for that thought process, there's the stimulus plus what it is you think about stuff that produces the response. When we look at what it is you think, then knowing how you think, the correlation between your thinking and what happens to you is better than .72. I've always thought an educator's function was to teach people how to think, using the tools that we have. We don't seem to do a very good job of that. Shakespeare is still popular because the characters in Shakespeare's dramas are just as crazy by our standards as they were by those standards. If the population ever gets sane, Shakespeare won't be so popular. Stimulus-response bond characterizes the research predominately in psychology, in management, and in education; and we keep looking endlessly for those small causal factors when we have this massive stuff in front of us on how human beings think.

Let me give you my conclusion of what you've probably put together, which is ultimately teachable in 100 different ways. Most of you, when I said please stand up and introduce yourself, thought something like, "It won't be good enough. I could make a mistake. Other people won't approve of it. It won't be in a conventional mode. I won't really win. I won't maintain status, prestige, power, influencing control like I think I should." Almost everybody in the room and, for that matter, in practically every room all across the country believes their sense of worth, dignity, self-esteem relate to those factors. What I just listed are all quite goofy. You saw some measures on what achievement looks like, what self-actualization looks like, what a genuine concern for people might really look like, and what affiliation looks like. Power, prestige, status, influencing control are used by the human being as if they were achievement and excellence. And they're not. If the need for approval seems and feels just like caring for somebody, then it doesn't work. If you decide to get by in life with just a camouflage system, you defeat every characteristic that you have in yourself that speaks about any kind of humanity. If we really had a population of healthy people, we would see a lot less conformity. Maslow's idea on self-actualization was the framework on what in the world people could become if they were excited about themselves in life. Eric Fromm in his book The Art of Loving said that it isn't whether people love you, it's whether you love them. These

are teachable concepts, but we keep missing the point. Let me take the simplest teaching phenomenon I can imagine. I think all across the country second grade teachers still have kids bringing in beans and they stick them in glass in the window with some water and the plant grows. Then they proceed to teach about the leaves and the root and the stem. But I think the foundation of agriculture is built upon the simple idea that if you make the effort to bring in a bean and you wet the blotter and you keep it wet and you keep it in the sunlight, your effort made a difference. That's how agriculture started in the first place. Maybe in that perspective the leaves and the stems aren't so important. As we enter the computer age, I hope we keep our minds on how people's efforts make some difference on that keyboard. And hopefully also in your thinking. Thank you very much.

FROM A LITTLE BIT TO A BIG BYTE: MOTIVATING YOUR STAFF TO USE COMPUTERS

Carl F. Berger

Garry: I'm to going to use a football metaphor, and in Ann Arbor that's an appropriate one. Imagine that it's the fourth quarter of a football game and the home team has gone up and down the field and shown flashes of brilliance and good form, but they just haven't been able to put it across the goal line like they used to in the old days. Despite some individual brilliance on the part of individual players, the team effort just hasn't been all that the players and the fans and coaches would like to see. The coaches aren't sure what it is that they need. They come up with the idea that maybe what the team needs is a new quarterback. Other quarterbacks have done really well, but at this time in the game, they need a quarterback who can come up with some new plays to inspire the team to some new efforts. They take one of the players on that team and play him as the new quarterback. The team really starts to move and show the kind of form and brilliance that everyone thought they had. In this metaphor, if you convert the players on the team to the faculty of the School of Education at Michigan, the fans to the alumni and the people in the state, the coaches to the University Administration, the quarterback is our new Dean, Dr. Carl Berger. He's been a faculty member with us for many years. He got his degree in science education from Berkeley, has taught in the public schools, and has worked for private industry as a training specialist. Most of all, we think he's a leader, somebody who has vision, commitment, and whom we want to work with very closely to help us show that kind of form and brilliance that we think are present in our faculty. So I take great pleasure in introducing you to our new quarterback, our Dean, Dr. Carl Berger.

Carl: Thank you very much. I'm also a member of the faculty, and by the way, I do have a 15-minute speech that I've been waiting two years to give, but being a professor it will take me an hour to do it. You may smile now, but you may not later. Essentially, the title that Garry gave me, I modified just a little bit. I hope you folks don't mind. I modified the title from, "From a Little Bit to a Big Byte..." (Very catchy spelling on the word byte by the way, did you notice that? Isn't that something?) to "Five Ways You Can Help Staff Guide Your Program to

Effective Use of Computers in School, Business or Industry and at the Same Time Reduce Tension, Decrease Body Odor, and Become More Attractive to the Opposite Sex." Okay, in other words, we get right down to the basics on this one. And I'd like to discuss five general topics. I don't think it's going to take an hour but I do want to spend some time with questions if you've got them. The five general topics we're going to take a look at are called, "Old Wine in New Bottles," "I Could Have Never Done That Before," "Recent Research About Computers and People," "The All-Powerful Computer," and "Computer for People and People for Computers." So those are the topics I want to get into and let's start right off with "Old Wine in New Bottles."

That isn't the way it goes is it? It's new wine in...? old bottles. Oh, no it ain't. It's truly old wine in new bottles because some of the worst stuff done in other types of media is now being put on microcomputers as if that's going to save the world, thus old wine in new bottles. Some of the techniques we've been using in the past have worked very well; and putting new technology in front of them, just to make them work better, sometimes doesn't make them work better. Indeed, if you've tried this and it doesn't make them work better, by gosh, don't use it. In other words, the same old garbage in, garbage out, is a strong negative against some of the stuff that we're doing. So be very cautious of that. Watch out for it.

Perhaps 80% of the software that's coming out time right now is software that is worthless, truly worthless. About two years ago, a guy by the name of Purser evaluated a lot of educational software and came up with the result that 70% of the software is no good. It's just bad programming and bad programs. We did an analysis (probably some of you had a chance to work with Peggy Schmidt and Ed Saunders and know the kinds of analysis we do on software evaluation), and we found out that Purser was wrong. It wasn't 70%; it was 80%. And the reason we added 10% to it is that some of it is very good programs, but it's very lousy education. Now, programmers are not educators. Let's get that basic fact out right now. There are very, very few people out there who are top notch educators who can also be top notch programmers because it just takes so blooming much time to write programs. So what happens is, very often you'll get excellent programmers but unless they talk to and work with educators, you come out with a lousy bunch of programs. So watch out for it; and remember, no matter how slick it looks, if it isn't educationally sound, it isn't there.

But what about something different? Maybe we will find something that works differently for the first time that we have never seen b[illegible]re. And before this one, I'd like to tell an Aggie joke. I see a smile back there. You're obviously not an Aggie fan. Is there an Aggie here? Is there a Texas Aggie here? Right there. Howdie. That's what you do when you're on an Aggie campus. You say, "Howdie." Everybody says, "Howdie." It is the most friendly campu[illegible] have ever been to, and I say that and I'm serious about that and I want to say that with a compliment. It really is a friendly campus.

However, it will not keep me from telling you this joke. It seems that this young person graduated from Texas A&M and decided to become a chicken farmer, and so went out and bought a gross of baby chickens and brought them back to the farm and dug 144 holes and placed each one of the chickens in (Have you heard this before? You'll love this one), placed each one of the chicks in each of the 144 holes, covered them up like this so their little heads are out like that. Then he went out and got a watering can and watered them. Came back the next day and watered them again. (I told you this was an Aggie joke; you didn't believe me.) ... watered them again and about two days came through... and the little chicks were gone, all gone. So he thought about it and thought about it, thought about this marvelous creativity workshop that he'd taken from Libby and Garry, and just like that--lateral thinking saved him, lateral thinking--dug up the chicks, threw them out, and went out and bought 144 more chicks and brought them back. This time he got two pounds of bone meal, put a teaspoon of bone meal in the bottom of each hole, stuck the chicks in head down, feet up, covered them up, watered them, but this time in two hours... two hours!... gone, just like that, gone. Creativity thinking workshop, uh-oh, okay, need help, need help. So he went in, dashed off a telegram to a professor at Texas A&M, explained the problem, what was going on, what was happening, and all that kind of stuff and thought, boy, if there's anyplace where there's creative thinking, it's at Texas A&M, so he waited, and it didn't take a day, a telegram came back. He was all nervous, opened up the telegram, took it out and sure enough, there it was--the telegram read: "Do not work. We believe we have your problem solved. Please send soil sample." You can apply that to any institution of higher learning that's appropriate. In fact, the way I heard it, it was applied to The University of Michigan, but I knew it couldn't be us; we don't have an agricultural school.

But anyway, the idea of that joke—I mean, yes there's an idea behind it. And while it isn't a heck of a lot of fun to start to analyze humor, it becomes less and less humorous as you analyze it more and more. Nevertheless I think it is valuable to look at something and to really bring up the notion of creative ideas with computers, with bringing in microcomputers. Very often, we have problems. We have problems changing our institutions with microcomputers when we bring them in. And very often we think the problems are closely related to the microcomputers, when in reality they're not related to the microcomputers at all. They are intrinsically related to the systems that we're talking about, the systems that we're working with. So, watch out. Watch out that if you bring in the microcomputers, you don't suddenly believe the microcomputers are going to do everything. And on the other hand, watch out for the times when, by putting something on a microcomputer, it really does work and it works well. Let's take a look at the next problem.

"I could have never done that before." New technology. Can we see the applications now? I want to talk about new concepts—simulations, spreadsheets, implications, integration and just color. I have a cartoon here for you, one that indicates where the action is. It shows a young man talking to his former employer of a hardware store and he says, "So long Mr. Schwartz, I'm leaving. Now-a-days software is where it's at." Okay, do you think they're going to get better? In any event, software is where it's at. And if any of you are talked into buying a particular computer because of that computer, watch out closely to make sure that indeed there is plenty of excellent software out there. One of the worst things that could happen is for you and your school district or your company or your business to, in essence, go out and buy a computer literally on the basis of the hardware. It's not the hardware, it is the software. And later today, I will break down and give you my completely biased opinions. I will guarantee nothing unbiased. Everything will be biased, but I'll give you some reasons why and I will call companies by name. I will not protect any industry's name. But watch out, boy, they'll try to sell you almost any computer; but you've got to be cautious to make sure that the software is there and it can be done.

Now the problem we've got with the software is we really don't know right now what software is going to make a difference as far as microcomputers are concerned. Just prior to introducing me, Garry used a metaphor. Now, being a dean, I am even more advanced than my professors, hopefully, and so I have for you

a metafive. Think back to the days of yesteryear. Think back to the thrilling days of yesteryear when a new technology was coming out and join with me now as two monks are sitting together doing illuminated text. (Notice the use of audiovisual aid. When I went to Colorado and I went to California, I couldn't teach, I literally couldn't teach until I had a course in AV. I took a course in AV. Guess what I got? You're right.) Two monks, one turns to the other and says, "Brother Garry?" "Yes, Brother Carl?" "Brother Garry, I hear there's this fellow over in Germany and he has this neat gadget; it's a new piece of technology and it literally comes down and it creates a page completely at a time and then he's got these gadgets to pull all these things together and it creates an entire book just... just almost automatically." Brother Garry looks at Brother Carl and he says, "Yep, there goes handwriting." And if you watched Garry this week with the overhead projector you know it's true. But, back to our exciting episode. In any event, Brother Carl turns to Brother Garry and says, "You realize what that means by being able to produce a piece of paper at a time and a book very rapidly?" And Brother Garry says, "Yes, yes it means literally to work so fast that soon, soon there'll be a Book-of-the-Month Club."

And when you think about it, that's just about where we are with microcomputers. We have no idea, quite literally, we have no idea where the technology is going to be and where it's going to lead us because right now, as I mentioned before, nine-tenths of the applications that we're using on microcomputers are the stuff that we've been doing on something else transferred over to microcomputers. We haven't found the new things. We think, for example, that something new in microcomputers is merely going to be an extension of what's gone on just recently. But we know that the future is not merely an extension of the past. There are going to be some things coming out that we have never seen before. There will be, for example, scheduling programs that students can do themselves. I really believe that we can see those things come out now.

In fact, right now, for example, we use a lot of that at the University. Last night, some of you had the chance to take a look at probably <u>the</u> application of microcomputers; it wasn't on mainframe computers and was a brand new application that people literally did not do before. And here I give you a simple example of it. This is a budget reduction summary; this is the actual budget reduction summary of our School of Education and we quite literally had to sit down with the

Central Administration with a microcomputer between us and battle out the budget on that chart. As many of you saw, you put in one change and the whole picture changes automatically. You don't have to take out your pencil or pen or something like that. It really changes. Let me give you an example of what I mean by this and what I mean by how that can really be so tremendous as far as new concepts are concerned. I was down in Texas (that's where I get these lovely Aggie jokes) in one of the schools where they do have computers for kids, in a third-grade classroom. And one of those gals came over, grabbed me by the pants, and said, "Come on over here, Mr. Berger," and I went over with her. And she had her table and there was this little computer and I sat down and looked at the computer and she said, "Do you see that sentence?" And I said, "Yes." She said, "I've worked on that sentence for a solid week before it was right and I take that sentence with me wherever I go." Now think about that. And then she said one extra thing which really triggered in me the notion of how a new concept comes out and how it changes the technology and she said, "You know, I worked on that for a week and when I got done, I didn't have a hole in my paper." Think about that. Didn't have a hole in her paper, huh? Remember, those days? Oh boy, I remember those days. Oh, you should see some of the work my doctoral students turn in. You would think they were religious, it's so holey. I told you it wasn't going to get any better. You didn't believe me, but I told you.

Okay, in any event, there are some tremendous changes going on right now with the way we're using microcomputers. You and I don't see it necessarily, because we're still so stuck in the old technology that we don't see those changes being made that happen almost automatically for the kids. The kids will use them in new and different ways. You can use them in new and different ways, and one of the joys of following up a session on creativity is you can let your mind roll on. You've got to try new and different ways of using that computer. For example, one of the ways we're finding out the computer really does pay off is in situations like this. Now unfortunately, this (I just grabbed it off the shelf as I left this morning) is a technique we're finding out about that really makes a lot of difference. I'll speak for my own area.

I'm an old science teacher from way, way back. Why, when I started teaching science, man had not yet gone to the moon. Think about that. Of course, I still go into schools where we're teaching out of textbooks where it says someday man will

go to the moon, but that's neither here nor there. Gives you an idea of how fast things really are going. Well, when I started, we didn't. But I can remember teaching junior high school science. I can remember teaching high school science, and then they found me out and promoted me to elementary school. Now I can remember... (Has anybody here taught elementary school ever? Raise your hands. Ah, that's wonderful. Salt of the earth, salt of the earth, right? Okay.) In any event, any junior high school teachers here? Middle school teachers here? May I congratulate you. That's the tough one, I think. I really enjoyed it, but it was tough.

In any event, I used to teach in junior high school and we try to teach the kids how to graph. We would spend so much time teaching the kids how to graph, that guess what... when they got done... guess what would happen? It was so tough just learning how to graph that they would finish the graph and then they couldn't draw any conclusions from it. They had gone through the graph and it was so difficult that coming up with a conclusion was asking way, way too much. We found that with the microcomputer we can actually have the computer draw the graph, and it will do it automatically. And then you can start to ask the computer questions, ask it ideas, and it will modify that graph based upon those ideas.

For example, let's take a quick look at these two graphs right here. Here's a graph of every bit of the data right here, and as you look at that graph you can't make a heck of a lot of sense out of it. Suppose you just asked the computer one thing. You say, "What would happen if we tried smoothing out the data a little bit. Get rid of all the individual data. Smooth it out. Average over a series of observations." Now, if you asked students to do that or if you tried doing that yourself, you'd spend so much time doing it that, when you got done, you'd be so sick of it you wouldn't draw any conclusions. But the computer can do that in less than three seconds. It does it beautifully and you can begin to see the pattern of what's happening. This happens to be a reaction to a photocell situation that we use in one of our classes; but it just indicates how the computer can help to answer questions and answer questions fast enough so that you can get the ideas and keep a train of thought going that you literally couldn't do two or three years ago. And I'm serious about that—you really couldn't do it.

New concepts, many of you saw simulations. You've seen simulations this week—I think that's an area where we're going to see the greatest change—the

ability to immediately try out a simulation, see what's going on. And one even more important part of that is to realize that a simulation is just a simulation. It ain't the real thing. Now counselors have known this for years. Scientists have not. Scientists get so wound up in their simulations and models that very often they equate them with the real thing. You folks have been testing kids. You folks have been gathering data on kids, adults, human beings, but I have never yet to hear a counselor believe that the data are the real person. I think one neat thing about using computers in new ways is that other people will begin to understand that the simulations have limits, that data gathering has its limits—it can help but it has it limits. Simulation is, I think, going to be a big help. Spreadsheets I just talked about. Putting it all together, I think, is just great.

We are right now in the midst of one of the most exciting studies at The University of Michigan where we are working with kids and parents and a computer to help kids make decisions about what things they're going to do next in school, or what things they may do next in their lives. We have done just one thing which we have already found out makes an incredibly significant difference, and that is, we have added color to our decision graphics routine. And we have put in colors very simply... red, yellow or green. Red means there might be some danger, the problem is we don't have the information. Yellow means to be cautious, and green means we've got the best information here and this is the most solid thing you can use. You can put those together and, with the color on the screen combined with the rest of the decisions, those students are making decisions of a major sophistication that we couldn't do—we couldn't do four years ago. With all of our models and all of our ideas, we couldn't do it, but put it on the screen, put it in color, put it in graphics and the kids and their parents can help make the most fascinating decisions, and they're down-to-earth honest decisions. They are not decisions about, "Hey, I'm going to become a doctor." You know, every student is going to become a doctor. Now at our university they're all going to medical school, right? You bet. Okay, they can make honest and realistic decisions. So software is where it is at. Watch out for the software. Watch out for new software coming out. Watch out for software that look's great, but really has relatively little educational value. Let's go on to the next one now.

Oh, I love this one. If you don't mind, we'll go on with some recent research that we've done at U of M in the field of microcomputers and people that I think is

the most fascinating. But, I'm sold on this cartoon. It says General Reassuring Hug, 25¢. Who was it that had the rubber arms coming out of the computer? Yes, you see. You were a little bit ahead of us. There it is, right there, General Reassuring Hug. But, the reason I put that on the screen is that it's true. It's really true. Our research, plus research all across the country, now is indicating that many of the kids see the microcomputer as being a general reassuring hug. Now, why is that? Well, think about it just a moment. When a child sits down and works with that computer, very often, and this came out in this session here, very often the child first names the computer, names the computer.

Anybody here from New Orleans? Aha, they're all at the World's Fair. If there were someone here from New Orleans (No, I wouldn't add another joke), I could really talk about a beautiful piece of research that was done in New Orleans about people who are adults who have had a terrible time reading. They just couldn't read. And they put together a beautiful computer program on a microcomputer and encouraged these people who are adults and literally have a terrible time reading. Starting out at the second grade reading level, they put them on the computer and the students improved their reading skills in a short amount of time. They will improve two years in about half a year—two years' reading skill in about half a year with these computers. But they noticed that these adults did one very interesting thing the first time they got their hands on the computer. What did they do? They named the computer—gave it a name—and they would talk to that computer, literally talk to that computer. Now the computer doesn't have to talk back. In fact, what is so neat about a computer is that it can give very constant feedback. I mentioned in the work on creativity this morning that too much reward stifles creativity. But a little bit of reward is great. That certainly backs up the research work of Mary Monroe down in Florida who found out that neutral responses or slightly positive responses are very powerful for kids. And so here's a computer that gives a neutral or slightly powerful response. In fact, very often the way the computer helps a student to get the right answer is, when they do get the right answer, the computer merely goes on as if to say, "That's what I expected from you."

And another very important thing that we found in our research is that the microcomputer or any computer is incredibly patient. I don't know about you, but I worked with kids in schools for 18 years and the toughest thing I had to do was to be

incredibly patient with some kids. And I don't know about you, but I can remember teaching kids and they'd walk out the door one day, and I'd say to myself, "Oh boy, Berger, you really nailed that one down. You really did it. That was probably the greatest and those kids understood." A wonderful image of myself as the great teacher, until when? Until test time. Some days it didn't even take till test time. They'd walk in the next day, I'd ask them one question, and that was it. They didn't know a darn thing, and you'd have to reteach the same thing over and over again. The computer can teach those same things over and over again and never get tired, make minor variations on it, get the kids where they need to go. It's really great.

The way in which computers act with people is really fascinating. They act, and they can be programmed to act, as a friend. Now a year ago when we used to develop software programs, we used to put in such endearing phrases as, "You got that wrong, you turkey." We realize now that you didn't have to do that. All you had to do if the student got it wrong was say, "Didn't get it. Try again." And slowly but surely we're learning to take out all the kinds of things that we do often in teaching. We're taking our computers and making them friendly and more consistent and more honest and all that, and it's really working out. Computers are for people and computers have to work with people.

One of the things that we found out is that one of the worst ways to use a microcomputer is to have a microcomputer with one child, one student, one teacher, one counselor. It probably has the worst effect. When we took a look at our data and plotted it out, and when we took a look at success versus the number of people, we found out that the results looked like this; that as we got up around three people apiece, just about three people with the computer (now that could be a counselor and a couple of other students, or it could be a couple of counselors with a student; sometimes it's more important for the counselors to have two counselors together with a computer and a batch of students than it is to have one counselor and a couple of students; or it could just be three students), we found that the learning and the information transfer just went up incredibly—just improved magnificently. Why? You know why. It's support. It's that interaction of person-to-person that is so blasted important; and one of the basic tenets that we've already found out about microcomputers and people is that it's the people that are important. Now you'd expect that, wouldn't you? But it's amazing how many programs are designed today to be one person with one computer. Ours show that that's not

true--that the microcomputer should support the counselor. The microcomputer should support the teacher. The microcomputer should support the decision maker. It should not replace the decision maker, the teacher, the counselor, the worker--it should support. And we're finding that that's the most effective technique, so we're finding two or three is just great. Three is fantastic. You get up to four and some people can start to pull away and be in the background and not participating fully. And that's where we run into problems.

"General Reassuring Hug." Yep, we found that the computer does give a general reassuring hug. That's what the kids tell us. That's what the adults tell us who are having troubles with learning. They're telling us that that computer is reassuring to them. They'll name it, they'll work with it, they'll get mad at it, just like they get mad at the teacher; but the computer doesn't get mad back. It just sits there and keeps working.

Drill, drill, drill, drill. I put that on the board because we have found one thing that just came out this last week. I have to share with you a little bit of research that's as old as three days ago. I'm sorry we can't bring anything newer to you. It's sad but true. This came out just three days ago, and we did a beautiful, beautiful study on helping youngsters, kindergarten kids, learn to use and work with a computer in learning addition facts through 9... addition facts through 9, not too difficult. We found out at the end of two weeks those kids were sick of the computer. Now wait a minute. I've always heard that computers are wonderful, great, that no kid ever gets tired of a computer. Right? Wrong. Those kids get as tired of the computer as they would any of us if we drilled them, day after day after day, in addition facts through 9. By the way, I don't know of any teacher anywhere who would drill kids on addition facts through 9 day after day after day on a sheet of paper. Would you? I can only think of about 50 states where that might happen. We make no bones about the fact that that happens in 50 states with a sheet of paper... and, by the way, it's using ditto paper. Anyway, we think nothing of giving out ditto paper after ditto paper after ditto paper to kids with addition facts to 9 on them, day after day after day. And we think nothing about the kids complaining about them. After all, isn't education worth enough to complain about? Right? But we're finding out with microcomputers that it is just as bad as it is with those ditto sheets. But with microcomputers we can try different things; we can work through them. We can try putting together programs that do not do

that. But our results show that if you give them drills, those kids get just as sick of those microcomputers as of ditto papers. And you heard Lafferty again last night back up our research done by Phyllis Blumenfeld at the School of Education--that by the time kids get to junior high school, they are more concerned about turning in the work than they are in getting the work done with any degree of excellence. It's just turn it in, get the next one, do it, turn it in, get the next one, do it, turn it in, get the next one, do it, and the payoff's got to be that grade 3.85. And what does that really mean as far as human interaction is concerned? So we found out that it is critical, just as critical with microcomputers as with anything else. And the drill and practice, while they can be superb on a microcomputer, can also be terrible. Exploring the limits, I think, is very important.

The all-powerful computer. I'll never forget the line as long as I live. "I am the all-powerful, great and wonderful Oz." Remember that? With Dorothy and the Wizard of Oz? And I can remember as a little kid just shivering right along with Dorothy, because here's this beautiful face up there, you know, with the smoke pouring out the sides and "I am the all-powerful, great and wonderful Wizard of Oz." And little Toto, remember the little dog in the Wizard of Oz? Little Toto runs over. (He's the hero of the whole movie, by the way. We have three dogs now. One of 'em's named Toto.) Anyway, he runs behind and he catches his little tail. Watch closely the next time you see it. (You've got to learn this; it will probably be a trivia question.) How did Toto expose the Wizard of Oz? The answer is with his tail. As his tail catches the curtain and pulls the curtain open, there is this little guy standing there cranking the crank, leaning in the microphone and saying, "I am the all-powerful, great and wonderful Wizard of Oz." And there we are with the computer--the all-powerful computer.

The cartoon on this one says, "Today's topic of discussion will be dehumanizing education." And it's true; it's true, my friends. Because what happens when you get those damn computers? I don't know... How many of you have a computer yourself? Raise your hands. How many of you have access to a computer? You don't have one yourself, but you have access to one? How many of you have just started to work with computers? Raise your hands. How many of you don't get that? A few honest folks, here, okay.

But what most often happens, we found, when people start using computers, (and that has tremendous implications for how you can make change, and that's

where this whole speech is going), is how all this impacts on changes we can make in our own systems. That is, people really attribute to that computer far more than it can ever handle—and ever hope to handle. They won't believe anything until it comes out of a computer. I want you to know if you have a student or parent that you're working with as a counselor and you can't seem to get anywhere, bring in a computer. Put anything on the screen; they'll believe it. They'll literally believe it. It doesn't have to be right. There's nothing wrong, you know, on the computer. If it's done by a computer, it's right.

After all, have you ever had any trouble yourselves with a credit card or a driver's license or something like that and you pick up the phone and you say, "I'm sorry, but you've got me overbilled by $147,000 on my MasterCharge for this month. Last month it was okay. This month, there's a little trouble. $147,000 overbilled. I think you probably slipped a decimal point. It's $147." And you know what the person says on the other end of the line? You've heard this yourself, haven't you? "I'm sorry, that's what the computer says." And you say, "But, wait a minute. It can't be right." "Well, I'm sorry, that's what the computer output says." And it takes you time, time after time after time, before you get them to go back and check and realize that probably the computer did say that. It sure did say that. And yet in reality what probably happened was the person that sat there and got the bill that came in and ran off the bill, slipped a decimal point somewhere. Decimal points are known to do that; they're floaters. Well, where do you think they got the expression of floating decimal point?

In any event, people attribute a tremendous amount to computers that they don't deserve, and I think we've got to be really cautious about that. So, the first impressions are just tremendously biased toward the computer being able to do everything. So watch out for those first impressions as you work in your district, as you work in your industry, as you work in your business. Watch out for how your people around you introduce those computers, but be very cautious. Be disrespectful yourself, if you've got to. Be disrespectful to that computer. You've heard of computer friendly programs? I don't want a friendly program. I want a respectful program. I want a program that treats me like an adult human being, one that I realize may have some things right with it and may have some things wrong with it, but the last thing in the world I want is a friendly program that will sucker me into believing nothing could be wrong with it. Just watch out for programs because all

of them will sucker you into believing there is nothing wrong with them, when in reality there is. Solid theory, not solid programming; watch out for the theory behind these things. Watch out for the Multiphasic Minnesota, Michigan and Mississippi Assessment Test because it's not a good test. If the theory behind it isn't good, if the theory's been discredited, just because it's the slickest thing on the computer isn't going to save it.

I've said this before and I cannot help but bring it up and say it again because it's one of the biggest problems we get in our school districts. They will often buy a program and know that program's not great, but it's one of the few things that can be used with the computer, so they use it until they get something better. My answer is, don't use it. Wait until you get something better. Really wait for it. Planned introduction. I think it is crucial that you folks, when you introduce computers, have a planned introduction to computers. Sure it's going to happen. It's gotta happen.

It's like right now we're in the level of technology that we were with automobiles back in 1910, where suddenly we began to realize that we couldn't get along without automobiles. If any of you believe this is a passing fad, forget it. If any of you believe that what microcomputers are going to do five years from now is sit on the corner and support the philodendron like the teaching machine (Remember the teaching machine? Where are they now? They're over the in the corner supporting the philodendron plant so it can get more light), forget it. Microcomputers aren't going to be there. Microcomputers are going to be part of our lives just as books are part of our lives, just as pencils are part of our lives. Right now we're asking such questions, and watch out for these in your school district or in your business or in your industry. You will hear such questions as, "How many minutes a week do the children spend on the computer?" May I ask you the following question, "How many minutes a week do your children spend on a pencil?" Yes, I'll say it again friends. How many minutes a week do your children spend with books? Well, that's ridiculous; with books or with pencils, you don't think about how many minutes. How many pencils do your students have? Okay. Right now that's a crucial question with microcomputers because we're at that level of introduction to technology. But ten years from now it won't be.

Let me give you an example. How much did you pay for your first pocket calculator? How much? $79. Do I hear more? Did anybody pay more for a pocket

calculator? $142. Do I have 142, 142, 142, okay. Okay, I paid $119 for mine. Do you remember it? Your first pocket calculator? (Oh yeah, I remember.) You betcha. In fact, I bet most of you who had your first pocket calculator can remember it. Some of you may still have your first pocket calculator. (I still have it.) You still have? Excellent. I paid $119 for mine because I knew that pocket calculators would go down to $99 and they couldn't go any less because, you know, that was just how expensive they were going to be, but they were going to be able to sell them for $99 and I couldn't wait that long and I figured I could spend the extra 20 bucks. For $119, and the thing would add, subtract, multiply and divide and one other thing which was just magnificent for me. It took square roots. Have you ever tried taking square roots by hand? Anytime you get the feeling that you want to be humble, find an old algebra book somewhere; it will show you how to take a square root by hand. It is the most humbling experience known to human kind. Okay, how many of you have a pocket calculator now? Raise your hand. Now this should be an exercise question. Put your hand up; I know you've got one hidden away there. Don't kid me. Hold up the number of fingers for the number of pocket calculators you've got. Look it, there's one that's got five, three, four. Look at this. Looks like a Cub Scout meeting. Sure, you've got plenty of them. In fact, now if you open a savings account or a bank account, what do they do? They give you one. It's a freebie. It really is a freebie. And they've got 'em now, you don't even plug them in or charge them up or use a battery. You hold them under a light somewhere and they work beautifully. You've seen those. They're magnificent. And nobody says anymore, "How many calculators do you have?" Do any of you remember the National Council of Teachers of Mathematics Study that four years ago—no, I believe now it's about six years ago, yeah, about six years ago—decided to do a two-year study on whether or not hand calculators should be allowed in the middle school. A year later they had to quit. Why? They were all over the place. You know it's like saying, "Should pencils be allowed in the classroom?" Don't laugh, I'm so old I can remember when it was ball point pens coming in. No, you're not that old. Don't shake your head yes. You betcha, fountain pens in there, it was beautiful. Oh yeah, I remember that. In fact, I am so old I still have a fountain pen. You know, it looks like a modern pen but don't kid yourself. It has real ink in it.

Ten years from now you're going to see the same thing with microcomputers. In fact, right now you can go out and buy a microcomputer for $44--a Timex microcomputer. You can go out and buy it for $44, and by the way, that is the best microcomputer for holding open a door I've ever seen. It's even shaped right, have you noticed that? A nice square shape. So the key here is I think you've got to literally realize that what you're planning now is going to change in the future. It's again that metafive I gave you about the monks there that we don't know what the technology is going to be. But we do know one thing--it's going to change rapidly and microcomputers are not going to be another passing fad. So you'd better start planning for them now. That means, like any change, you've got to put in all the elements of change that are necessary. You've got to have involvement of everybody--everybody's got to be involved. There is just no other way to do it. And I believe that they've got to have the option of saying, "I'll be involved, but I'm not going to be doing it." Do you understand what I mean? There are people out there who are not going to be using microcomputers. Just as 200 years ago there were people out there who said books are just a passing fad. I don't need them in the classrooms. So I think you've got to be very, very cautious about it. But everybody has to be involved. In the first place, you can't do it all yourself. So let's take a look at the last one here, because here is what it really comes down to.

Number five: Computers for people and people for computers. Stress and burnout prevention. I just think that these microcomputers are the neatest things for stress and burnout prevention that you've ever seen. Better job, not less work, spread the wealth, and it allows you to focus on the real thing we're trying to teach people. Let me show you these two cartoons which, I think, are just great.

Here's the first cartoon: "Getting a job this summer?" "Yup. I'm going to be a computer operator." "What?" "A computer operator. I got the idea from this here math book cover." "You're kidding, let's see." "See right here it says, 'Earn $7,000, impress your friends, meet girls." "Can't beat it, son," he said. Next cartoon, they're in there, he's doing it. He's literally doing it. "Nuts," he says. The other guy says, "What's the matter?" He says, "Well, I spent three days putting a new program on tape and now I can't get the computer to accept it." He says, "Hey, Moe, don't push that button." And on the screen it says, "Attention, your entire program has been destroyed." And he says, "Ahhhhhhhhh!" And the other guy says, "You've got to relax." I can tell myself, I consider myself a challenged

amateur...in computers...as I know some people here also are. You know when you're an amateur and you know when you're a pro, and I know I'm an amateur. But I will tell you the times, and I will tell them to you in great detail, when two to three hours of straight, hard, creative problem solving, letting it go, coming back and saying, "By gosh, that's it," putting the line in on the program that solved the problem magnificently. It worked beautifully! Then the power went out and you lost the whole thing. You know I told you I have three dogs. One of the dogs hit the power cord and pulled it out of the wall. That dog doesn't have a tail left. No, it wasn't Toto, it was the other one.

In any event, if you're talking about stress and burnout prevention, I really believe microcomputers can offer a partial solution to this and the reason for it is one that Lafferty got started on last night. I think that burnout for many people is really a result of boredom—doing the same thing day after day after day, year after year after year—seeing the same lack of attention by the kids, and moving backward all the time. You really feel that you're not getting ahead. You're certainly not earning any more money. Most school districts have a salary schedule, but once you get to the top of that salary schedule, you're done. I've seen some teachers (they're not as bad as some of our professors whose class notes were done originally, and are still, on papyrus) who have given the impression that they have not changed the way they're doing it. They have not challenged themselves. They have not gone into a risk situation with those kids, and they're really feeling burnout.

I think burnout can come from two things. Number one is boredom and the other one is just asking far, far too much for people to do. I think both of those things can do it, and I think microcomputers can literally help in both areas. They can give you new ways of doing the things you've done before that can be very exciting, very exciting. And I will tell you that they can help you do things you have never been able to do before.

Now do any of you believe, right here, that by getting a microcomputer and learning how to use it and getting some really top notch programs, you're going to save time? Is there anybody here that believes that? Put your hand down. There is no way that you're going to be able to save time. That computer will not save you any time. You will claim it does. You will claim that you can...that you're really saving time just as I did in fact this morning with these overhead projection

things. I did these on a little word processor on the MacIntosh computer because you can do the nice graphics and things like that. It's a really beautiful computer. But I didn't save time because I could have sat down on a typewriter and done the same thing in less time. But do you know what I was doing? I was coming back and changing the fonts to Old English on those. Notice, I've done illuminated script on each one of the letters in front of these things. See the Old English here. I went back and put in the Old English, and, gee, that turned out really great. I wonder what else I can do. So I went back up and I put that in Venice script and then I did a little shadowing on it and all that. When I got done, I had spent just about the same amount of time as I would have originally if I had written it out and then sat down and typed it. I did it all on the MacIntosh. I didn't save any time but I sure had a lot of fun. I really did; I enjoyed it. I can put some of my creative energies and artistic values that I claim I have and everybody else does. You don't either, huh? Okay. In any event, I didn't save time, but I think the quality of my work is better, and if not the quality of my work for you folks, the quality of my interaction with life. I can have that notion of playfulness that Libby and Garry talked about, that notion of enjoyment and playfulness which I think is so desperately important in our lives today as we're being driven to do more and more. But if you think you're going to save time, forget it.

(Participant: I still think I'm going to save time. Do you want me to give you an example?) You want to know the truth? I think you will, too. Give me some examples. (Participant: Well, I'm particularly interested in the stock market. If I want to know some stock that's selling under $15 a share that's paid 20% over the last five years, and I want to do that over 600 stocks, I can get that information out of the computer a heck of a lot quicker than I'll ever get it in some other way.) You betcha. But do you know what you're going to do then? When you get that, you're going to say, "Gee, I wonder what ones are under $20." (Why, yes.) And you'll be better off for it because you will be able to make a better decision because you'll have more information. But I claim you're not going to save time. Now, you <u>are</u> going to save time. Literally, you will. But the key is, you'll use that time probably to make better decisions. And, boy, is that exciting because one of the neat things about education is shouldn't we all...shouldn't we all in our own professional lives be doing a better job, constantly adding more information, making better decisions, having the where-with-all to make those decisions. I claim so.

And I claim that that microcomputer can keep my time level about the same so that I can do that. That's great.

One of the things that I swore I'd never do is get on one of those computer conferencing systems. Now, some of you had some time with Tom Switzer and Chris Canning and saw the computer conferencing system. I hope you did because right now I'm on nine of them. Nine of them. Nine computer conferencing systems. Now I realize that nine-tenths of the time my reaction, if somebody asks me a question, is: "Yup." "Nope." "Maybe." With me, it's almost always maybe. But, nevertheless, the kind of information I'm giving or the kind of interaction I can get with people across the country is fantastic. I would claim that if you want to know one of the ways to get people going on this stuff, get involved in a national computer conferencing system where you can interact with each other at a distance. Interact where you are. And every now and then you'll see something come up on that computer conferencing system where you'll say, "My gosh, I could have never gotten that kind of information. It is so timely. It is excellent." So you'll be using it to be better decision makers, and I think that is the important...a very, very important point.

Let me put on number five here again if I can find it there. "Better jobs, not less work, spread the wealth." There's one thing I think you've really got to have the impact on in your area, whatever position you're in—school, industry, business—and that is to make as many people as possible an expert on something. Do you follow what I mean? Don't do it all yourself. It's awfully easy for you to fall into the trap of being the expert on everything. And right now, microcomputers happen to be at the place where you can learn enough about them that you can be more of an expert than most people on almost anything. But don't do it. It's not that it's bad for you, but it's bad for them. You've got to get that level of involvement going. Now you all know about Roger's curve of innovation and how you have a normal curve of distribution. You've got early adopters, and next adopters, and then the vast majority of people who really adopt it when they see something is going well. Then you've got a group that wait until almost the end before they adopt and then you've got the group that never adopts it. You know, there are some people that still don't use ball point pens. So there are those that will never adopt an innovation. The key is that what you've got to do is enable those early adopters up at the top of the curve to help you become the expert so that information can go

or. As computers get better and better, you don't have to have all the information. You don't have to be the one that they keep coming to. You've got to share and spread the wealth.

Now how do you do that? I claim the way you do that is to get people interested in microcomputers by giving them something to use with it that is going to be useful for them. I'll use your example because it's perfect. I don't know if there is a heck of a lot of people in this room who are interested in using their computer to access information about the stock market, but it can be the greatest darn thing for you because it's going to be useful. It's going to be timely. It's going to give you information you could have never gotten before. I have seen teachers, quite literally, whom we at The University of Michigan have trained to use the MacIntosh computer to do word processing, in 15 minutes, 15 minutes of word processing on that MacIntosh, and they're doing stuff like this for their classes. And I heard one of them say to me, "That's the best thing that ever happened to me. I spent hours with all those drawings. Now I can do it right now like this. I got this done in 15 minutes and I even learned how to do it while I was doing it." So they see that as being terribly important for them. Other teachers are going to see other kinds of things important to them. For example, some teachers are going to see this as a neat way to go—having something like that to help them out to show information. Other teachers are going to see other things as a neat way to go.

Okay, in any event, you've got to share the wealth. If you're going to get your program, you've got to involve people. It's got to be more than you. You've got to be the kind of person that shares all that—that gets it out—involvement. At our table we were talking about a neat thing about getting two people, or two counselors, involved so that one can be talking while the other one's working on the machine. When the machine fails, notice I didn't say if, when the machine fails, there is somebody there that you can turn to and say, "Damn it, it did it again." Because you can't do it with the kids and you really can't do it with the kids and the parents. You've got to have support. Believe me. So share that wealth. Get started with two of you working on things. Design your own programs.

Some of you have had an opportunity to work with Ed Saunders in some of the elements of BASIC programming. Anybody here take in that one? You folks chose the right one. He was pretty good, I thought. In any event, BASIC programming looks tough. It is tough. But, boy oh boy, it can make a difference. You don't have

to write fancy programs. That's another myth I think that's out there. People always say, "Do programs have to be very fancy?" They don't have to be fancy. You can write very simple programs to do some really neat things that you can feel good about. After all, how many school districts not only have textbooks that are professionally written but also write some of their own curriculum? How many teachers out there actually write some of their own curriculum, have kids do some of their own curriculum? How many teachers out there produce ditto, produce xerox material? You know that that's tremendous. Think of the same thing with programming. You may get some beautiful, fancy, very professional programs, but knowing a little programming, you can do some very lovely things yourself that do not take a great deal of effort. You'll never be happy with them. You'll never be one to make them professionally and sell them commercially. Oh, some teachers will, but you don't have to. They can be yours, and they can be your client's and your kid's programs and, boy, that can be just great. So those are the basic ideas on dot four--helping to share with you, how you can change the schools and, at the same time, reduce tension. We talked about that. As for the remaining items promised in my modified title, if you have any questions, I'll be glad to answer them. Thank you very much.

CREATIVE SUSTENANCE: ENHANCING OUR CAPACITY TO RECREATE COUNSELING

Garry R. Walz and Libby Benjamin

Garry: I don't know about you, but I've always enjoyed light bulb jokes, and I'd like to start our session this morning with a couple of quick ones. How many politicians does it take to change a light bulb? (Just one—but he also needs a crowd to tell him whether to turn it to the right or to the left.) How many attorneys does it take to change a light bulb? (Well, how many can you afford?) Here's one that's a little closer to home. How many counselors does it take to change a light bulb? (Just one, but the light bulb has to want to change.)

We'd like now to begin to set the stage for our discussion about creativity and change. Here are some quotations from people who have thought deeply about creativity.

> A childlike man is not a man whose development has been arrested; on the contrary, he is a man who has given himself a chance of continuing to develop long after most adults have muffled themselves in the cocoon of middle age habit and convention. (Aldous Huxley)
>
> Imagination is more important than knowledge. (Albert Einstein)
>
> 'Tis to create, and in creating live a being more intense, that we endow with form our fancy, gaining as we live the life we image. (Byron)
>
> If want is the mistress of invention and necessity is the mother of invention, isn't it time for Mr. Creativity to stand up and be accounted for? (Gerard I. Nierenberg)

All right, let's warm up our creative juices. I'm going to put a few symbols on the overhead projector, and I want you to think what it is that the symbols represent, that is, come up with a word, a description, or a phrase for each symbol.

BLACK
COAT

(Participant: Black overcoat.) Good! Can you all see that? A black overcoat. Black over coat. Now let's do another one. This time please don't call out the answer. We want to give everybody a couple of seconds to think about it, and then you can volunteer.

T
O
U
C
H

(Participant: Touchdown.) Good. Now try this one--a little more difficult.

Who knows it? (Participant: Easy on the eyes.) Excellent! You'll have more opportunity to test your creative powers a bit later. If you did well on these, that's a good sign; if you didn't, well, that means that the kind of things you're going to be doing today should be helpful to you.

To get into the substance of our morning, let me tell you our objectives. First of all, we want to talk about the process of creativity. What are some of the major concepts? The definitions? Why creativity in a workshop devoted to technology? And we'd like you to see the relationship between creativity and technology as we see it. Then we'll move from that to discuss how we can use creativity in counseling to encourage creative behavior, to facilitate creativity, in the people whom we counsel. Then we'd like to identify some of the blocks to creative behavior. What keeps people from realizing their creative potential? Next, you'll have the opportunity to experience some exercises that foster more creative thinking and behavior. Then last, we're going to give you a task, working in small groups, to restructure counseling along more creative lines.

Libby: We're excited about our topic today because creativity has to be one of the most stimulating of mental functions. To create something new, to bring something new into existence, has to be one of life's most exquisite joys--whether it's a new machine, or a new idea, a new song, a new recipe, a new person, a new flower, a new counseling approach. Our creation has our own stamp on it and it can be intoxicating to us. The evidence suggests that people really enjoy involving

themselves in things that demand divergent thinking, that take a little bit of creative application to the task at hand. People want to learn in creative ways—by exploring, by manipulating and questioning, by experimenting, risking, testing, and modifying their ideas. We can all do it. But some of us can do it better than others because we have developed our creative bent. Some research suggests that, indeed, we can teach creativity. But researchers believe that most of the time we only use 15% of our creative talent reservoir. But when we start to employ certain techniques that help us to be creative, some very important things start to happen. We see ourselves differently from the way we did before. We see ourselves doing things that we never thought possible or never even thought about before. And you know, since we've been working on creativity—you know how when you're working on something, you cue into all things that might apply to it—well, the other day Joann Harris-Bowlsbey said something that was just exactly what the researchers say. Remember, she was describing her development of the program DISCOVER and she said, "I had never thought about that before." That's the exact thing that happens to us—we begin to think about new things. We see new capabilities opening up and our attitudes toward ourselves begin to change. Instead of saying, "Can I do this?" we say, "In how many ways can I do this?" or "In what ways can I do this?" And this sense of heightened self-concept and personal fulfillment and power is a most positive side benefit of a creative act.

Definition of Creativity

All right now, what is creativity? Most of us think of creativity as this aha!, this spark, this moment when the illumination comes and we develop something novel and fresh. But according to the theorists, creativity is far more than that. And it's really a very complex process with fairly identified phases. Very simply, here is a definition we've decided to use this morning: Creativity is an action producing a result that is, first of all, novel—something new, strange, innovative, different, something that hasn't been done before, something that hasn't been seen before. Secondly, useable. Have you ever thought about that? When you think of creating something, it's typical to think of somebody with a huge jumble of machines that may not do anything at all except go around in circles. But, actually, the true definition of creativity includes the criterion of usefulness. And third, understandable—the idea that it can be produced, discussed, implemented, shared

with somebody else, replicated, and so forth. Three things: novel, useful, understandable.

The Process of Creativity

In preparing for this discussion we reviewed a lot of resources and tried to condense them, and there seems to be general agreement among researchers that there are five major phases in the process of creativity. First of all is the preparation phase. Now, we all have to prepare for being creative. It doesn't just happen. We need to lay the groundwork. We learn the background about a situation. We assess and review it. We become aware of some kind of a problem. And as we build a base of information and skills and resources, we begin thinking about some alternatives. This base of information, experience, resources, is critical to the creative process. Much of this has to be done on faith, because we don't know what we're going to be working on ten years from now; we don't even know what we want to be working on ten years from now. But every experience we have, everything we're involved in, adds to this wonderful base of information and resources that we can call on when the time comes. And that's why we urge people to involve themselves deeply in whatever activity they're in and be aware of what's going on, because in that way they build a tremendous base of information and experience. Let me share with you a quotation I thought was very interesting.

> Invention is little more than new combinations of images which have been previously gathered and deposited in a memory. Nothing can be made of nothing. Those who have laid up no material can produce no combinations.

So this would behoove us to involve ourselves totally in new experiences and also to urge our children, our students, our clients to do the same.

Second stage--concentration. This is where we focus our attention. This is the hard work stage. Creative people are usually very intense about what they're doing. They are able to concentrate and shut things out--sometimes to their sorrow, in a way, because they kind of turn off family, work, leisure, and everything else, because they're so focused on their problem. This continues the learning of the preparation stage, but much more intensely. It is a period of trial and error, of drawing together a number of materials; it is also a period of false starts and failures--and it includes frustration. Again, let me refer to Joann. Remember,

when Joann was telling us about the process of creating her program, and she said she got so frustrated. Well, that's a real part of the creative process.

Third stage--incubation. This happens because people can maintain this intense level of concentration for only so long. This is a very valuable stage, but one that is not totally understood. Ideas turn around in our heads; and whether this is because our brains continue to work on the problem unconsciously or because we simply need time to regenerate ourselves, nobody really knows. But if we have been fixed on some kind of a solution in these first two stages, the chances are that the fixedness will begin to disappear in the incubation period. What we really do in this stage is let it go. We simply push it away and let it germinate somewhere in the unconscious or the subconscious.

While we're in this stage, we're also sorting and clarifying at this unconscious level. And it's really necessary here that we relax. Researchers suggest that solitude is imperative if we are to create something really important. This stage usually involves images and metaphors and some kind of intuitive hunches, and maybe even a kind of dreamlike state. But as a result, we may find ourselves breaking out of our mold, being more open to new experience, stepping into the unknown, and having the courage then to go against the pressure to conform.

And this leads us then to that Aha, Eureka, I have found it! stage of illumination. Have you ever had that experience where you've been working and working on something, and you've either been dreaming or concentrating during your sleep, and when you first wake up in the morning, the solution rushes in? Have you had that? Yes, it's really--"Why didn't I think of that before!" And one of the interesting things about the illumination stage is that it seems so simple. And we wonder why we didn't think of it before. When I was a little girl--I think it was about the fifth grade, when you learn the history of the United States--I must have had a creative teacher. I don't remember much about her except this experience. She told us how they had big states and little states and they had heavily populated states and sparsely populated states. And they were trying to devise a method of having a representative government. And I thought to myself, "Gosh, you know, you have Texas and Nevada, and they're so big but hardly populated, and then you've got the small but heavily settled states of Massachusetts and Connecticut. How can they possibly find a solution that will satisfy everyone?" I just couldn't figure that out. So she had us work on it--you know, "What do you think the government did?

What do you think?" And when we learned that they created two houses of government, to me it was an Aha thing. I didn't do it myself, but I thought, "Of course. How simple. Two ways of representing the states in the government." And that was an experience I had as a very little girl. Illumination is the delicious part of creating; it's kind of the dessert course. It's the time when everything falls into place and the flashing light comes on. Sometimes the impact can be enormous. We even experience a kind of euphoria. And it's even better and happens more strongly when the solution springs out of the unconscious. Then, as David Campbell says--the delightful, witty, immensely likeable David Campbell--"When you were not even thinking about the problem, the solution, like an affectionate butterfly, floated gently up and landed on your shoulder." Lovely.

Our insights in this particular stage are significantly affected by our prior experience, our knowledge, and unconscious work on the problem. Vernor has said that this stage represents "the fruits of unconscious work." So even while we're not actively working which we did in the second stage where we really focused on the problem, or in the incubation period where we let it go, the illumination phase thus does reveal the fruits of unconscious work.

The last stage is verification or production. And this is kind of a new thought to many of us because we feel that creativity kind of stops with the creation--but it doesn't. It's a total process. And the Aha stage is really only the end of the beginning. A lot of hard work remains to be done in developing and implementing the insight that we have. We need to test our idea; we need to convince people that our idea is workable, possible, testable--and this is where a lot of creative people fall down. They don't have communication and people skills. They don't know how to be good change agents. They're wonderful at inventing, but not too good at communicating. So they should either learn these skills or turn the task of implementation or production over to someone who knows how. This stage requires a lot of persistence and a lot of people-oriented skills.

Now, the development of a major important concept usually follows this process, but with a lot of recycling. You can go from illumination back to concentration or incubation as you examine whatever you're working with and think, "Well, it won't work; it needs this," and so forth. So it's a recycling process.

Now I'd like you to look at this wheelbarrow. Even if you may question it, this is a wheelbarrow. (Shows a picture of a strange, lop-sided wheelbarrow.) Okay, as

you look at this wheelbarrow, please write down very quickly five comments about the wheelbarrow--five comments. What do you think about it? (Responds to audience comments, most of which are humorous or negative.) All right, we have heard many reactions. And thank you for getting involved. An interesting thing has occurred. Most of the comments were negative, were they not? I heard one over here from someone that it might be really useful--that it might make a nice flowerpot. The point of this is not to make you feel put down or anything. The point of this is to show how most of us react to something new and different, and that is that we find fault with it. Or we criticize it.

So let's look at something called the PNI. This is a form of approaching new tasks, new things, new ideas. P--what are the positives? What are the things that are good about this plan? N--what are the negatives? What are the things that make this look impossible? And I--so very important, what are the interesting things about this idea? I think we all agree that interesting reactions are much more creative than critical ones. Yes, sir? (Participant...) You have brought up one of the most significant points about being creative, and that is having background. I don't care how much skill you have in mechanical ability or musical aptitude or jogging, the chances are, if you have a limited vocabulary, you will not be able to write a really very good poem. And it is the person who can write the poem who has mastered the craft. This gentleman is suggesting that if you have a background in industrial management or psychology or whatever, you can bring that knowledge to the creative process. It is this store of resources, experiences, memory that makes creation possible. Very important point. I'm glad you brought that up.

In PNI, the suggestion is that we look at the positives first. We certainly aren't going to be able to improve upon our objective unless we consider the things that are going for it. Next, we consider what are the things that need improvement--the negatives about it. And then, if we look at the interesting things about it, we have a new approach. It's like an idea spectrum. Let's say you have a matrix, and down the side you list all of your ideas about a certain thing you wish to do. And at the top you have the criteria that each idea satisfies. For example, you write to London for a list of hotels, knowing what your desires are. And then you say, "This one has a shower in the room," or, "This one allows children," or, "This one has free parking," or "This one has a TV and a telephone in the room." So with

this idea spectrum, the more checks you have in the positive end, of course, the better the idea is. But, it's good to take the position that almost any idea has some positive features.

Characteristics of Creative People

We decided to talk only briefly this morning about the characteristics of creative people, a topic which is usually included in a discussion on creativity, and I want to make some brief comments on this because I do think it does relate to the subject. Highly creative people are energetic and helpful. They have a steadfast purpose. They are independent in their thinking. They are enthusiastic, quick, probably fluent. They can make fertile mental associations and have vivid imaginations. But they possess two particularly strong traits: self-sufficiency and independence. The creative process involves a lot of conflict, and one has to be able to endure this tension because of the wonderful, ultimate purpose and response that is going to occur. When creative people are faced with a new situation, they get excited and they get involved. And that's part of the enthusiasm of the creative person. So, we urge you to value and nurture those fleeting urges in yourself that have to do with discontent and status quo. You know, as we age, our discontent wanes. We become more comfortable. We don't want to rock the boat. We resist making waves. We think it's better to be seen and not heard, let sleeping dogs lie. We like to enjoy our autonomy, and it is very good not to be a problem-maker. So everything is upside down for creativity. Because creativity means rock the boat, make waves, cause change. And movement toward creativity necessarily involves the risk of failure. And most of us don't want to get into that. But if we take the risk, we can experience the zest that comes from doing something really creative and living with real issues and processes. It's true, in doing this, we become exposed to the possibility of pain or of failure, but we also can experience true joy in our living.

Gary: The wheelbarrow illustration reminds me of the story of a security guard who heard that a man was trying to smuggle some things out of the plant. So he watched carefully, and sure enough, at closing time a man appeared with a wheelbarrow full of something covered with a blanket. And so the security guard searched the wheelbarrow, found it was only full of straw, and reluctantly let the man go. The next day the same thing happened, and each day the search became

more and more thorough—taking the straw out and going through each little piece. Eventually the guard just gave up and said, "Look, I'm not going to try to punish you in any way. I know you've been trying to disguise something and get it out of the plant. Just what is it you're doing?" And the man replied, "I'm trying to get away with some wheelbarrows." I use that as an example of divergent thinking—that is to say, the focus, the fixation, was on the fact that something was hidden, but the man's thoughts were away from what was expected. And so he was able, because of that, to get by.

Using Creativity in Counseling

Libby has presented the creative process. I think our next step is to relate this to counseling. Why are we concerned with creativity in the counseling process? Well, we have both personal needs and societal needs, and currently the big push in this country is to increase productivity. People like Toffler and Naisbitt are all saying that in an information society the most valuable aspect of human resources is the creativity that people can bring to a variety of problems and situations. If one looks at the number of patents being requested by American-born citizens, one finds that the quantity has gone down steadily. Requests for patents in the United States are increasing more for foreign producers than for our own citizens. Many people, in fact, are more concerned about the visible lack of creativity in our behavior than about the so-called mastery of the basics.

If this be so, I think we need to say, "To what extent does counseling facilitate creativity? Does the experience of going through counseling help people to be more creative not only in arriving at solutions to personal concerns but also in all of their daily lives?" Now we have research to suggest that different forms of counseling produce quite different outcomes—not all creative by any means. You look at psychotherapy, behavioral psychology, other forms of helping systems that border on the judgmental or the authoritative, and you will find probably very little emphasis on facilitation of creativity. Move then to developmental counseling, the human developmental approach, and you find counseling focused more on growth, enrichment, liberation, transformation, transcendence. So when we talk about developmental counseling, an increasing goal of many counselors in all settings, we note several basic attributes and basic conceptual undergirding for what it is that we're talking about in the creative process.

One area where the need for creative action is very strong is the area of business and industry. Organizations like 3M, Exxon, Apple, provide regular training in creativity for their employees. They're as much concerned about fostering their creative ingenuity as they are about improving their ability to solve technical problems.

A good example of this was an organization that produced potato chips--a product with very high breakage, very large shipping costs, and difficulties in quality control. So they assembled a team, used some of the creative processes we have been describing, and came up with one of the most successful recent product developments in consumer history. You know it by the name of Pringle Potato Chips. They took a former product which had high breakage, big volume requiring large shipping boxes, and great variance in uniformity, and which engendered problems in sorting good from bad potato chips--and developed a machine-oriented process, small containers that were easily shippable, almost no breakage. A very successful, creative economic solution.

I know of a consultant who was invited by a company to help solve the problem of an elevator that was too small. The company could not afford a new elevator, and people complained noisily about their frustrations with that elevator. What is it that everybody does when he gets on an elevator? (Participant: Watch the floor.) Watch the floor. So the consultant found a solution that was inexpensive, easy, and very successful. He suggested to the company management that they cover the walls of the elevator with mirrors. So instead of looking at the floor people looked at themselves. This reduced the number of complaints dramatically.

Creative activity should be part of the counseling process. If we could integrate creativity into our current counseling approaches, we could do much to help our clients maximize two things: first of all, produce more creative answers, creative outcomes; and second, enhance their ability to use creative processes in planning and decision-making. So how do we incorporate creative approaches into our day-to-day counseling?

Futurization is a very effective way of getting people to move away from concentrating on the present, dealing with a kind of conversion thinking, to examining their own situation from a futuristic point of view and establishing long-term goals--giving themselves a vision, if you will, of what can be in the future.

Researchers at Stanford conducted a very interesting follow-up study of a sample of geniuses to see after a period of four years if there was a difference in terms of outcomes between the geniuses and a control group. They found a dramatic difference--the geniuses far surpassed the other group in terms of notable achievements and societal contributions. When they looked for differences, they found that the geniuses were consistently involved in setting future goals and visions of what they wanted to be or do; and when you talked to them, they would say, "Here's where I see myself going--this is what I'm working toward." They were very good in futurizing. There's one thing about futurization that really needs to be emphasized. Many people, when they think about futurization, say, "That's neat and theoretical, but what I'm really interested in is my present needs. You know, I don't care about future shock; my problem is present shock--just trying to get by day by day." Here's a key concept. Your images of the future have a critical influence on your present behavior. Let me give you a dramatic example.

Recently the Associated Press carried a story about a prominent scientist who concluded that the atomic holocaust was due to occur within the next five years. As a consequence, he took his children out of school, sold all of his possessions, and with his wife and family is now devoting his life to traveling about the world experiencing different cultures. He's convinced that when the holocaust comes only a few people will remain, and those who do will have to reconstruct society as we know it. A very dramatic and perhaps extreme example of the startling impact of someone's vision of the future on his present behavior. Because our visions of what the future will be, our futurization, so strongly influence our present behavior, we should examine them carefully to see how appropriate and meaningful they are.

Let's move next to <u>divergent thinking</u>. If you listen to counseling typescripts or observe counseling interviews, you notice how frequently the focus in the interview is on finding an answer, a constant kind of narrowing. What does this test mean? What decision are you going to make? What is it you're looking for? Some of the worst examples of this, I think, occur in career planning courses. Have you ever known a teacher who said, "Before you can get a grade in this course, you have to choose an occupation. You have to come up with a choice." Always the idea that there is a right choice, and many times just <u>one</u> right choice. Well, what can really be accomplished if you encourage people to think in a divergent way? Say, "Let's forget what the tests show, your experience, your background. Try to let all

those things go and deal with what is really important to you. Concentrate on your values. Focus on what you want, even if it is far afield from what you are or what you have. Think what would be very different for you, unusual, in the opposite direction from the way you've been thinking of going." Such an approach begins to free people up, to help them consider some alternatives and possibilities that they might not have thought of. A typical high school student can name only about 40 occupations, and most of those will be described in very limited fashion. And many will make occupational choices within that very limited range. One of the ways we can help people move away from traditional thinking with regard to their career is to open their minds to divergent thinking.

Incubation is included here in a very generic way. Have you ever become terribly frustrated about a problem and said, "To hell with it!" and walked away from it--and then a bit later had sort of an Aha, light bulb experience when an idea, a solution, came flooding into your mind? Well, if you consciously stop thinking about something, often your subconscious continues to work and reflect on the problem. Sometimes we act in counseling the way we do in classes, where we feel we have to read x number of pages of the textbook. We have what we call MMPI interviews, and MMPI counselors--not the Minnesota Multiphasic Inventory, but More Mileage Per Interview. Let's get people in, let's get solutions, let's get answers. A period of incubation can be a very useful and creative kind of process. Creative imagery involves putting yourself into a situation, imagining that you are doing something or that you are there. In business and industry they're using an advanced form of this called synectics, where people try to imagine themselves as molecules that are moving, or blood vessels or plants, and they experience all the processes as a way of helping them to see options and new ways of doing things. Imagery has also been shown to have very meaningful results in areas other than creativity. A group in Oregon conducted a small research project having to do with improving basketball players' ability to shoot baskets. They divided the students into three groups. One group spent 15 minutes a day shooting baskets. The second group did not shoot any baskets at all during the time of the project. And the third group was asked to devote 15 minutes each day to mental concentration, imaging holding a basketball, shooting, and making the basket. After a period of one month, when all groups resumed practice, the group that did the mental imagery of shooting baskets improved more than those who had actually practiced the skill.

And this is what we call sports psychology today--helping people get on the edge, on the top, of their form through the use of creative imagery, a technique that can have enormous influence on our behavior.

Suspended judgment. Suspended judgment is basic to the whole notion of brainstorming, which has been shown to be a better way of reaching creative solutions than by individuals working alone. Brainstorming really involves suspending judgment. As Libby was saying earlier, if evaluation comes too soon, if discerning appraisal of something occurs too early, then it's likely to have a severely limiting effect on idea production and likely to cut off creativity. So, the underlying concept of brainstorming is to suspend judgment until people have had the opportunity to free their minds, loosen up traditional trappings, express divergent, different, futuristic thoughts--before any evaluation occurs. One thing I have learned the hard way is that if I'm working on something, I don't ask people to comment on what I'm doing too quickly. For example, if I'm writing a paper and have what I think is a good idea and am excited about it, and then I go to somebody and say, "What do you think of this?" and they say, "Really, I don't understand it; I don't know what it is you're trying to do; it's not very clear," I get kind of irritated. I didn't want an evaluation. What I really wanted them to say was, "Garry, that's really great. Sounds like the start of something wonderful. I'll be anxious to read more on it when you're farther along." Then you smile. Evaluation too soon can really be hurtful.

There is a wonderful little book called Is There Life after High School? The author talked to people all over the country and was amazed to discover the extent to which high school experiences remained with people throughout their life--25, 40, 50 years after they had left high school. People were either very positive or very turned off about what had happened to them in high school. Many people spoke of negative experiences related to times when they were evaluated. That was something they never forgot. Gregory Peck was denied the lead role in a high school graduation play, never forgot it, and never let those who made the decision forget it, either. I think the best anecdote was told by Margaret Truman about her father. When Harry Truman graduated from a little one-room school in Missouri, he went up to the stage to get his diploma. The procedure there was for the teacher to give each student a hug as well as a diploma. (We're going to give you both when you leave here, too.) So when it was Harry's turn, the teacher gave him a diploma

but no hug. He said, "How about my hug?" She said, "Harry, I'm not going to give you a hug because you don't deserve it." He was deeply hurt. And within one day of his ascendency to the Presidency of the United States, he called his former teacher and said, "Do you think I deserve that hug now?" Suspended judgment--a very important part in encouraging free creative thinking in daily life and in counseling interviews.

Multiple options and choices. The focus today increasingly is on the outcomes of counseling, on the idea of coming up not with a single option or a single choice but a variety of options or choices with consideration of probabilities, e.g., "If I did this, these kinds of outcomes might occur." We are learning to think of counseling outcomes as involving multiple options and multiple choices. I bring this up because we're going to touch on it when we talk about technology. One of the critical questions we have to ask involves the kind of software we plan to use--Does it lead to multiple options and multiple choices? Are we back to the old trait-and-factor, the write-ins, the best answer, the answer? With our current state of knowledge regarding the future, no one can predict anyone's career path today. About as close as we can come to an accurate prediction is to say that most of today's elementary children will experience at least five careers in their lifetime--so the ability to conceive of options in thinking about career possibilities is the appropriate way to proceed.

And then, last of all, the idea of whole person resources. We know that we're influenced not only by our logical left brain but also by our emotional and affective right brain. And these interact with one another and affect our decision-making and our behavior. In counseling we tend in many ways to be rational. We talk about decisions in a logical kind of way and sometimes neglect to allow individuals full opportunity to express gut-level emotions or feelings. And yet our reasoning and our feelings interact in such a way that not providing for full expression of both may actually blunt the wisest kind of decision-making and the creative process.

How can we use this knowledge in counseling? Well, what we can do is try to bring a greater freedom into the counseling process, to push less hard for answers, for decisions, and to provide more support and encouragement to the individual to move less in a direct line and more into a "Let it go." "If you had your 'druthers, what would you be like? Forget about the job you feel you should apply for. What kind of life would you like to lead? Paint a picture of yourself for me. What might

things be like 10 or 15 years from now? Where would you see yourself 10 or 15 years from now? In fact, paint several pictures for me--verbal pictures of the kind of person you could be and would like to be. What would your life be like? What rewards and satisfactions would be most meaningful for you?" We are really concerned with creativity. We need, as counselors, to model the process, to be creative in our interactions with our students, and to help them learn to apply creativity to their decision making.

We're going to leave this subject now and move to a discussion of some difficulties and blocks that impede creativity.

Blocks to Creativity

Libby: With all the emphasis we've been giving to the positives, we're going to talk for just a moment about the negatives. And the reason is that we believe that if we understand some of the things that go wrong in the situations where we work, and some of the blocks to creativity within ourselves, then that may be an initial step into making some change.

Before we move into that let's tease our minds a bit more. (Shows the following figure on the projector.)

0
MD AB
BS PhD

Anybody? I heard zero degrees; that's pretty good. Four degrees below zero. Good.

In the environment. Okay, let's talk first about possible problems where you work. Now you know more than anyone what the problems and the blocks to creativity are in your particular setting. Research has uncovered several as being the most common. It's possible that your problem fits into one of these that I'll be describing, but you may have another one.

First of all, the fear of failure. When the penalties for failure are much stronger than the rewards for success, creativity is stifled. In many organizations the penalties for failure are worse than the penalties for doing absolutely nothing at all. When there is pressure for immediate results, people focus on programs that are short, that will produce something--even if it is ordinary. And when there is a certainty or predictability that failure will be punished and certain outcomes are

expected, people will prefer routine, traditional, "this is the way we've always done it" kind of programs over the innovative, the fresh, the creative, the new.

Second, preoccupation with order and tradition. Excessive reverence for the past nurtures conformity. It may produce stability but it may also cause the operation to be stagnant. A lot of times people are uncomfortable with messiness of any kind or of ambiguity, even in personal relationships, and there are some rules that husbands and wives can't work in the same place, older people shouldn't be taught by younger people, men shouldn't report to women. Things like that. Some of these are not only unpleasant and undesirable but illegal.

Next, resource myopia--failure to see your own strengths and the strengths of the people around you. One organization had a secretary who was very, very good at conducting a meeting, but never got to exercise this talent because it just wasn't done. Resource myopia is very often found among pragmatists and realists who see things as they are, but innovation thrives on seeing things as they might be. Formal, chain-of-command type organizations are very susceptible to resource myopia.

Then you have the specialist disease of overcertainty. "I am so expert about this and I know so much about this problem that no one can possibly teach me a thing." They say there are three stages in life: 0 to 7, we ask, "Why?" 7 to 17, we ask, "Why not?" 17 to 70, we say, "Because." People who really know the subject or think they do are much less open to new approaches. They are experts because they have worked hard to learn something well and have proven their expertise in the past. But history records a long list of innovations that came from outside the organizations with all of their experts. And here are some interesting facts: The automobile was not invented by the transportation experts of the era, the railroaders. The airplane was not invented by the automobile experts. Polaroid film was not invented by Kodak. Hand-held calculators were not invented by IBM. Digital watches were not invented by watchmakers.

Number five, reluctance to exert influence. A lot of creative people don't want to appear pushy. They don't want to seem to be flaunting their ideas. Consequently, sometimes the most innovative people in an organization are not the most forceful and they may even be withdrawn. It would thus behoove any organization to try to eliminate their resource myopia, make sure that everyone's views are heard, and reinforce the production of ideas.

Another, the reluctance to play. Sigmund Freud said, "The opposite of play is not what is serious, but what is real." In formal organizations people are usually very serious. And because they don't want to appear foolish, they hardly ever try "What if" or "Let's pretend." But play is a marvelous way to stimulate creativity. Stuffy organizations don't cultivate people's fantasies or the imagery that Garry has talked about. So a lot of these things that we dream about, muse about, and say "What if" about get lost. Playfulness does have a place, a strong place, in creativity. If you watch any animals at play, in the process of growing up, you will see the place of playfulness, where the young cuff each other and their parents cuff them and so forth. And, indeed, it may be play now, but it teaches them survival skills when they get to be grown-up, mature animals. Now, if people are to play, they have to have a lot of support, and there have to be some people to carry on the work in the organization. Sometimes these roles change from person to person. But organizations that prohibit play and prohibit the play kind of thinking are probably stifling creativity.

Excessive reward for success. When people are asked to solve problems requiring a creative solution, they're more successful when the stakes are low than when the stakes are high. If you were present when Dr. Lafferty spoke last night (and if you weren't there, you missed something), you heard about that experience where they decided to remove the threat of anxiety for the employees, and production went from something like 27% to 92%. The managers said, "Hey, it's okay if you don't learn it in six weeks. We expect you to, but if it takes six months, that's okay. And if you find you just can't learn this task, we'll move you to some other place where you can." They simply took all the anxiety away and these people really became turned-on. Now if you offer a little, tiny, minimal reward, sometimes that excites people because it increases the fun and the play. In another situation, teachers promised a $25 reward to the student in one student group who found the most creative solution to a problem. In another group they offered no reward at all except to kind of turn each student on to the excitement of finding a different way, to feel the importance and challenge of solving a particular problem. And, of course, you can imagine which group was most effective--the one that was given a tangible stimulus, but not enough to cause anxiety and slow down creative juices. When the payoffs are very high, however, that's inclined to be stifling.

In ourselves. Let's talk now about blocks to creativity within ourselves. I imagine all of us consider ourselves to possess some element of creativity. We have some thing that we think we can do well or come up with. So let's look at some of these very briefly. First, sometimes we have difficulty in finding words to describe what it is that we want to produce. There are some people who do not communicate verbally as well as they perform. For example, you have the musician, where the notes seem to flow out of the hands, or the painter, or someone who has kinesthetic skills. People who can do but cannot share ideas. Sometimes the lack of ability to communicate to others gets in our way.

Second, we're afraid to laugh and we're afraid to play and afraid to have fun and to do new things with ideas and materials. We can't be like children. When you have groups of teachers and student teachers together, which group do you think is the most restrained? Who take themselves most seriously? The student teachers. They are so anxious and so concerned and so afraid in this environment with all the experts. Whereas the people who are comfortable and who have experience can let the bars down a bit.

A tendency to analyze rather than synthesize, to take things apart, to get out the microscope, to look at all the different aspects of something. That's an important thing to do. But the creative urge brings things together, looks at a process, looks at the whole, and tries to see new uses or new ways of doing things.

A too quick synthesis. This is what Garry was talking about when he mentioned deferring judgment--leaving the evaluation until later. "Let's try it. Let's think about it. Let's take all our ideas, put them together, see what we come up with, and leave the final solution for later."

Here's a real hard one for most us. And that's to get rid of something that is in our head. We have a traditional way of doing things, and we have never thought of a different way, have never seen the need for a different way. I went camping with a friend recently and she had a set of pans with a separate handle--a handle that clipped on. And she clipped the handle on the bottom which made the pan kind of top-heavy or something. And I looked at it and without even thinking about it turned the handle over and clipped it on the other way, on the top, and it made real leverage for the pan. She said, "Gosh, I never thought of that." Now I'm not saying that was so wonderful, but it was just the idea that I'd never seen it before and had no history to get in the way. But her mind was fixed. She had always done it a certain way. The idea of doing it differently had never occurred to her.

Preoccupation with worry. If we have something on our mind, if we're depressed or concerned or whatever, that will likely hinder our creativity. If we're very tired, if we're lethargic, if we have worries or are preoccupied with an overriding anxiety, the chances are we can't be creative.

And then, last, and we spoke of this earlier--the lack of a rich background. We should try as much as possible to immerse ourselves in new experiences, involve ourselves and see things in new ways, use all of our senses--explore, investigate, experiment, risk failure. All of these experiences and new knowledge are going to contribute to our ability to find creative solutions. And when we come to the point where we need to draw upon our inner resources and experiences and information, they're all there, ready to be tapped and re-ordered and combined in new ways, new words, new approaches.

We are going to move now into techniques and exercises that stimulate creativity. We have several things that we could suggest to you. Although we may not have time to actually go through very many of these, we're going to talk about them; and perhaps with Garry's creative imagery, you can imagine yourself doing some of them. Then when you have your group tasks, perhaps you can employ one of the techniques we are going to share with you.

Exercises in Creativity

Garry: As Libby said, we're going to introduce you to a number of techniques that you can use--some we will only demonstrate, but this is one we'd like you to do because we think it will be useful to you later. Please have a paper and pencil ready.

What is this? It's a teabag, right? All right. Imagine yourself a member of a company that produces remarkable teabags--except that there is no longer a need for teabags. Your task is to try to come up with creative ideas as to how this company can find new uses for teabags so that they can stay in business. What could teabags be used for other than holding tea? To respond to this, we'd like you to use a form of brainwriting--not brainstorming, brainwriting. What other uses could there be for a teabag? Please write down on your paper two ideas that occur to you. Once you have come up with two ideas, put your paper in the middle of the table and take someone else's paper. When you read what another person has suggested, it may trigger some further thoughts for you. The idea is to build on

others' ideas and go laterally, divergently, whatever. So just take any slip in the center, add ideas, put it back, take another, and see what you can come up with. Keep writing and sharing for just a few seconds more. No talking yet, please.

Okay, please talk with the others at your table about all of the ideas that were presented and try to reach agreement on one or two of them as being particularly creative. We'll then have nominations from each table as to what you saw as the most creative ideas.

(Suggestions from participants follow.)

Thank you. If you thought of the bag as something to put something in, you were probably less creative than if you thought of other ways to use it, that is, continuing to put things in the teabag represents convergent thinking. If you thought of totally new ways to use the teabag, you were exhibiting divergent thinking. (Participant: Garry, we thought you might be stuck with a couple of million teabags, so we thought of recycling them and using them for packing material.)

Libby: What we would like to do now is share with you some techniques and some exercises that you can use to enhance your own creativity or to enhance the creativity of those with whom you work. Let me ask you right now to please fold your hands. Okay, everybody's hands folded? All right, now fold them a different way--not anything bizarre, just fold them a different way. Doesn't it feel funny? I mean, when you fold your hands, you fold them a certain way, don't you? This is an exercise in fixation. We get physically fixated on various things we do and we get mentally fixated in ways we think. And that's a very small example of a habit. Now fold your arms. Garry and I were doing this last night and Garry couldn't even do his a different way. He was so... He's a very creative person, however. (Garry: Research shows that left-thumbers are more creative than right-thumbers.) Left-thumbers? Would that mean the left thumb on top? How many of you have your left thumb on top? I think it has something to do with right-handedness.

(Shows a figure on the projector.)

$$\frac{\text{MAN}}{1 \times 10}$$

This is our very last one. What is it? Pretty hard, I know. What's a 1 by 10? A board, yes. So we have... Good! Man overboard. You know, creativity is exciting and fun, and a workshop on creativity should have some play things included. So if you're doing something with people on creativity, make it fun and just put some of these things in to stimulate divergent thinking. Now, Garry has told you about brainwriting, and this is one technique you may use as you get into your group tasks. This is where you write, you shove the papers around, and everybody in your group grabs any old paper and writes. And pretty soon you have a whole list of ideas generated by the thoughts of every group member. That's one technique. Brainstorming we're also familiar with; I'm not going even to discuss that. There's another thing called attribute listing. Let's say you have a counseling program and you want to change your technology or you want to change your approach or you want to adapt your program in new ways. What you do is examine what you have in a positive way--you list the attributes. You list as many as you can--the staff, the resources, the rooms, the facilities, the number of clients, your current technology--anything that you think could be considered a really good point about your program. Then, taking one attribute at a time, you focus on that and say, "How can we improve this?" This reduces the large goal into manageable, workable facets. Attribute listing.

Next, we have something called forced relationships. This technique may sound kind of far out, but it trains the mind to see unusual combinations. You take pairs of objects and try to devise unusual combinations for them. Just very quickly, let's take shoes and windows. How can those be combined? (Participant: Planters on the windowsill.) (Participant: Prop up the window with the shoe.) So there are some examples of this technique. The wheelchair was a combination of two things that were not usually combined. The clock-radio was another combination. Unusual things put together, which takes somebody's creative mind.

This technique can also be applied in a way to creative writing or story plotting. What you do is make four columns: character, goal, obstacle, result. And then you list ten characters totally unrelated to each other--a mouse, a person, a giraffe, a chair, whatever the character of your story might be. Then the goal--What's the purpose of the story? Ten goals. Obstacles--things that get in the way, as different as you want. And results--ten. This is a technique developed by Franz Stricker who wrote the Lone Ranger series. For better or worse, then, if you

combine any four elements, taking one from each column, you've got the elements of a story. You've got a character with a goal, and something gets in the way of it and produces an outcome. This approach has proven to be a source of some highly original ideas. It's interesting to note that if you combine these ten items in each of these four columns in as many ways as possible, you will come up with 10,000 story plots.

Another good technique is to turn your problem around, perhaps broaden it, or turn it backwards. Instead of saying, "How can I build a better mousetrap?" say, "How can I get rid of mice?" This gives you a new perspective on the problem. Instead of saying, "Why doesn't this counseling technique work?" say, "What needs do my students have that aren't being satisfied?" Once you do that, you find yourself looking at the problem in a new light. So when you get together today, try and turn it around. See if you can look at it from a different perspective.

Lateral thinking, which is the idea of thinking this way (spreads hands sideways), not this way (makes vertical motion)--not drawing inferences or making syntheses, but going broadly. How many different things can we do with this? You did that with your teabag. Finding uses for the teabag was lateral thinking. We spread out and do some creative thinking.

One of the things that we try to do, too, is use our five senses. They've done a lot of interesting things with children. They take them out into the city and one group is to smell everything; one group is to taste things, like the grass and the leaves; one group is to look; one group is to listen; and one group is to touch--all the textures: cement, the flooring, the smoothness of the Stop sign and so forth. And then they come back and write about their experiences in a kind of metaphorical way, like, "I am the Stop sign." "I am the flashing light," or, "I am something..." Very interesting.

Another way of having people experience things through the five senses is to have people just look at their hands on the table and then write down what they note about them. Most people will say, you know, my rings, or the wrinkles, or the veins sticking out, or my nails need cutting--that kind of thing. Most people will use only the visual sense. But how neat it would be if somebody you work with decided to experiment and taste their finger or smell their hand or describe it by the shape, describe it by the sensations and feelings in relation to other parts of the body. There are so many things that we don't use. We rarely use smell or taste or feel and touch. We mostly concentrate on seeing.

We've described several little creative exercises you can do, and they can be fun for you and those you work with. (Refers to previous exercises the group has done.) You saw the matches, the moving of one match to make something totally different. You saw the "How many squares?" You folded your hands. One interesting thing you might try sometime is in the color green write the word "black," in the color red write the word "blue," in blue write "orange," and so forth. Then ask people to read the colors that they see, not the words that they see written on the colors, and some people have a lot of trouble doing that. Just expose one at a time and ask them to read the colors.

Another interesting exercise is how to cut a pie into eight pieces using only three cuts. Do you want to try that? Just take a piece of paper. Make a round pie. That's the first thing. And try to cut it into eight pieces using three cuts. Pies don't have to be round but this one happens to be. This asks for divergent thinking. Have you got one? What did you do? (Participant: I cut two across and then another circle inside.) Excellent. Very good. Notice what she departed from. She departed from the idea that every piece has to be wedge-shaped, from the idea that all the cuts have to be straight, and from the idea that the pieces have to be equal in size. Another one? Yes. (Participant: ...) Excellent. Really different thinking—taking the pie out and cutting it through the middle. Good.

Another nice exercise is to write squiggle stories. They're just as appropriate for sophisticated adults as they are for little kids. Well, children have to be old enough to draw something and need to have some verbal skills. I would think not for preschool. But you draw three squiggle lines in any old way. Then you pass it to your neighbor and that person has to connect the lines in any way that seems appropriate and write a story about what he or she has drawn. In this story something has to happen and there has to be an outcome. And the story can be just three lines. Or whatever. But it's a real fun thing, frees your mind, gets you into the play mode in a very creative way.

An interesting way to get your mind going on some kind of a task is to write down 15 absolutely unrelated words. Anything, anything--crocodile, parasol, spoon, whatever. Fifteen totally unrelated words. And then see how you can apply any of those to your problem. Sometimes it can be the catalyst that helps you become more ingenious, triggers your ideas, and gets you started thinking. A particularly good use for this is when people are having an awful lot of trouble writing some-

thing they're supposed to write. Just give them 15 words, have them choose any three of those words, totally unrelated to one another, and write a story around them.

This is the last one I'll share with you, and it's one that could be used for counselees who have trouble focusing on themselves and being able to experience their own feeling states and being states. This was used with a group of very recalcitrant, drop-out boys--and the last thing they wanted to do was be in a creative writing class. First, the teacher made sure that they all had papers and pencils. Then he just started talking very, very softly to them about the things that they considered private, their own things that were very important to them. And then he said, "I'd like you to explore some of the feelings that we all have about wanting to be alone, your desire for privacy. We all have those times when we just want to be alone." And then he had them close their eyes and he said, "Forget everybody else; focus on yourself, your breathing," all the time talking very softly. He got them into the mood. Then he asked them to image their bedroom at home. It didn't matter what kind of a house they came from--whether they shared their bedroom with three other people or whatever. He asked them to picture the objects in their room, to enter their room mentally, to be alone in their room, to see how it felt to be alone in their room. After they were really into it and had thought about it in depth, he asked them to open their eyes and to write six lines that would simply tell other people about their feelings about their room. It was terribly effective and the boys were surprised and gratified at the results. A very nice way to help people bridge the gap into examining their feelings about something.

Okay. Here we go to our last task.

Garry: Well, we've talked about the creative process. We've suggested some ways that it might be applied to counseling. We've given you some practice in using different forms of creativity, in ways of stimulating creativity. Now, we've really come to the bottom line of, "Can we use our creative juices to do something related directly to technology?"

We're now going to give you a task to do at your table while you are eating lunch. You might find a creative way of processing this thing like: Nobody gets to take a bite unless they come up with an idea, or The best idea gets the most food, or whatever. What we'd like you to do is to please use some of the things that

Libby and I have been describing, whether it's brainwriting, attribute listing, or whatever. See if you can't use one or two of these techniques to help you come up with your response to the task. You have an option as to how you want to do this. Some people here feel that they work better with people from similar settings than they do with people from different levels. So you know who you are: You're a red, a green, or a blue. And you should feel perfectly free to get up and join those from the same kind of work setting. Remember, creative people are independent, self-managing, and not concerned about external views. So, if you think your creativity will be more stimulated in company with people more like you in setting, please move to a different table.

Here comes the question. How can you increase the usefulness of computers in counseling and the human services? I've just listed a few of the targets that you might have in mind, and these have all come directly from our previous discussions. Many people have stated, for example, "We really can't motivate our staff of counseling to use the computers. We have them. Some of our counselors use them well. But some are neither interested nor want to be involved in using them." Others of you have said, "Well, we have them available but they really don't seem to turn the students on the way we would like. We feel, however, that once they did get involved, they would find it very rewarding and satisfying." Part of what we're talking about here is anxiety about using computers, fear on the part of counselors. In one of the groups yesterday, a very articulate person spoke about a phobia he had about using a computer. We have some ideas about how we might deal with that. The emphasis here is not on the traditional or the usual, but on more creative approaches. Examples: How about the idea of getting support from your administrators for buying computers? Many of you listed this as the most difficult problem. Math and science, sure--anybody's prepared to support getting computers in those areas. But how about for the counseling service? What could you do in a creative way to get that message across? And then how about an increase in computer time? Suppose you have a mainline, as a number of you have, and you can't get a terminal, or you never get enough time on it? Are there some ideas about what you might do to increase the availability of time? These are illustrative, but they certainly are not limiting or definitive. They are only suggested to kind of trigger your minds. The task, then, is to discuss a common problem with your group and come up with some creative ideas. When the time is

up, we're going to ask each group to appoint a spokesperson to share what your group believes to be the most creative solution to this task. Everybody understand? Good eating and good creating.

Could I have your attention please? I heard one person in the hall say, "One good thing about learning this creativity business is that where they used to be called disorganized before, now they can call themselves creative." Please come up to the microphone.

Participant: We had several ideas, but the first one had to do with how to motivate counselors, and we felt the other things would fall into place if we had that first very vital thing done. Hypnosis was suggested. And you could say something like, "Your most recent evaluation is in the computer and in order to get that information you have to find out how to access it." Or have the counselors spend a day at the Apple Corporation or IBM or whatever your hardware is, maybe shadowing someone. The one we liked the best, however, was having a computer fair for counselors that could be set up by representatives of the different corporations. Consultants familiar with problems of counselors and also familiar with the software and the hardware available would be there to work with these counselors. Everybody would work together on designing a package for their particular program. They would have the latest information available. The idea would be to come up with the very best package using what's available and also your own ideas. We didn't get into details on how the very best would be selected, but it would be some combination of a peer vote or the representatives voting or something like that. But the very, very best package developed during that particular process would be rewarded by (and this is a biggy) a trip elsewhere to help others and become a sort of consultant--maybe Burmuda, maybe Japan. We're talking a big trip, and that person would then get to work with other counselors doing those kinds of things. Those are our ideas.

Participant: This is the last time I'm going to wear a blue shirt. We thought of having a competition between administrators, faculty, counselors, and students--some kind of game-playing competition--so that everybody would be involved in having fun to reduce the anxiety and maximize the interest and help motivate. But everybody in the school would be involved. The second one was to take the computer to the kids. One school is already doing this for orientation and registration, so that the first thing the kids see when they walk in new to the school is

the computer and they are immediately involved and have a hands-on kind of thing in the process of using the computer in a fun kind of way. The third thing was to match people by personality types through the computer, either kids and teachers, or just the kids, in some kind of game-playing activities, but instead of red, blue, and green, they'd be matched up by their basic personality types.

Participant: We didn't have a lot of creative ideas, but I think the single thing that came through in our short discussion had to do with making the computer more available to students. One of the gentlemen talked about orientation--in the orientation program students have the opportunity to go through a computer module--so we talked a little about that. Industry also offers a number of opportunities in partnerships where industry is selling the products. They love to expose counselors, teachers and everybody else to what computers are about and how they can be useful, so I think that kind of partnership with industry, with engineering schools and colleges, is a way of making sure that the computer is simply available. And many schools, we all know, don't even have that. The instrument, the hardware itself, is not even available.

Participant: Well, we had lots of creative ideas. They were just flowing at the table. Then we had a couple that had to do with this problem. One idea dealt with what happens between the computer and the client. Make that something that happens very easily, where there aren't a lot of forms to fill out or people to talk to before the person gets to use the computer. Another idea is a lot like the way we work now where we get a certain amount of sick time or vacation time. How about for every period of work on the computer, you get so much free time on the computer to do personal computing, searches, balance your checkbook, draw pictures, whatever--the fun things on the computer?

Participant: Our group had a lot of ideas, but we came up with a surefire one. One of the areas that counselors seem to have the most difficulty with and spend the most time on is scheduling. So we thought we would devise a computer game for students to schedule themselves. And in this game would be images of the teachers and images of the classes and the student would match these things. Then as a reward, when the students finished their schedules correctly, images of playperson centerfolds would appear on the screen--and by doing that we figured by the end of September we would have everybody scheduled.

Participant: Our group was process oriented and we came up with a three-step process. Number one, be patient. If you have studied change models, these things don't happen overnight. We can't expect everybody to be an expert the second week of school. Number two, be a role model. Don't talk computer use, use the thing. As people see you using it, hopefully making your life a little easier or making you more effective, they're likely to adopt some of the same things. And number three, make the computers available--days, nights, weekends, to staff, to kids. Keep the lab open nights and weekends so that anybody that wants to use it has access to it.

Participant: We took a research approach. The first thing that we would do is form a C^3 think tank. We would also make it a mandate that everybody--kids, staff, all members of the school, the school board--everybody understand computer applications. The next thing we would do is get an ESEA grant--we call them Commonwealth Institute Inservice Grants. You get $3,000 to train school personnel. Here are the people that would be in the training programs: school board members, superintendents, administrators, counselors, teachers, and students. Students are permitted in our Commonwealth Institute Inservice Grants. By the way, we really did get that grant.

Participant: I have a 15-minute speech I've been aching to give for a couple of years. I guess I'd better not. There's some research that shows that teachers overcame computer anxiety when they were allowed to play games with computers. And if we could make it possible for counselors to do the same, and not be criticized for wasting time by playing games on the computer, that might help them overcome possible anxiety about using them. Another idea had to do with improving retention rate. One argument toward such improvement is that the clearer a person's career goal is, the more likely he or she is to stay at the institution. One study (done by one of the ladies at our table, under Garry's leadership) shows that people who worked on DISCOVER, and who also had some counseling, were likely to have a higher degree of career decidedness. So you see a linkage here that suggests that technology might ultimately increase retention. This next one involves looking for better ways to display information. There's a problem about the cost and time involved with the creation of videos, but one of the things you can do is create some things on micro. Then find a way to put that information on video tape, put a video tape recorder outside your office, and show things on the video screen. So

that's a way of linking technologies that might be kind of interesting. And if I may add, because of my involvement with the state office (and this may be useful elsewhere, too), I'm going to, one, encourage the development of a user interest group under the rubrik of MPGA or as a division of AACD; and two, for professional development in the state, I'm going to support one-day skill building workshops--take the technology out to a variety of locations where people can avail themselves of it.

Participant: We came up with the thought of taking the computer into the community, going to where the people are, taking a microcomputer to a shopping center, to the library, or perhaps even to church meetings. In this way people outside the school could begin to see that these things are user friendly, and might give more support for their adoption. Members of the community might then also realize that computers would be useful to them, too. You might also ask counselors to evaluate some of the user friendly programs. Hopefully, in this way, they would be motivated to take ownership along this line, and then to develop a kind of a mini-C^3 Experience for others in their district or in the area.

Participant: I'm going to tell you two things that we used at our school. It's not being creative, but they have worked. First of all, all teachers were given a $25 stipend to come in on a Saturday morning and go through some training on computers. And second, after that computers were made available on weekends for counselors or teachers to take home. And this has worked very well because people don't feel pressed for time. They have the opportunity to try out different programs on their own. And from a selfish standpoint in counseling, I think it would be great if the state could provide software for counselors in, for instance, a workshop setting or teachers institute, so that they could go through the various programs. This might be helpful in deciding what software might work best within a particular school.

Participant: We talked about two things. One is that you have to get some inservice or college credits every so often for salary purposes. So you might design a specific inservice workshop just for counselors, leaving out math teachers and people who might have a lot of knowledge about computers, where they could learn how to use them and how to use them specifically in their particular area. The second would be to have a contest to come up with a way to use the computers that would benefit the system costwise. The person that won would get a percentage of

the savings to use toward the purchase of a personal computer--so it would continue to have more than one benefit.

Participant: I think my late arrival at the podium represents my table's style of waiting till pretty late in the task to confront it. Anyway, we narrowed down the issues that we were going to deal with and focused on how to gain support for adoption. The question was more pragmatically phrased as, "How do we get money for computers?" One of our table members then turned the problem around, using a technique we learned this morning, from "How do we get money for computers?" to "How do we get computers?" And money might be one way of doing that, but there are other ways. We realized that the parents of many of our students have computers and the students themselves often have computers, but some schools don't have computers. So we decided to do a kind of "What's in it for them?" creative analysis. We decided to have a computer fair where vendors would come to the school to present their hardware, software, whatever, that they might sell, and they would give the schools 10% of the gross sales. The vendors would thus have the opportunity to increase their sales; the school staff, students, parents, and other community members would have an opportunity to see in one place the variety of computer equipment available; and the schools would be encouraged to buy.

Participant: The ideas at our table ranged from simply making computers available very early and regularly to students all the way from kindergarten on through, which would make an easy transfer to using them at higher levels, to mandatory inservice for staff. Many public schools have mandatory inservice days for one purpose or another--so simply mandate that part of that time be used for a computer workshop or software fair type of thing. Encourage teachers and counselors through some kind of incentive--extra pay, free tuition, or whatever might work--to get training in programming skills, because many teachers will say, "Well, it doesn't do what I want it to do." If they know how to do very simple, basic programming, then the computer will do what they want it to do and the excuse is lost. And the final thing to do is to equip every computer with a pair of rubber arms which automatically come out of the side every three minutes and hug you.

Participant: We decided that we would just take this exercise back home and let our counselors come up with some creative ideas so that we wouldn't stifle them. We did have some other ideas. We thought about having a computer party

for the teachers and the students. Set the computers up in the halls or in the cafeteria so they would be out there where people could see them and use them. Stagger times for counselors so that they didn't all have to come in at 8:00 and leave at 5:00. And eliminate all paperwork for counselors who use the computer.

Participant: To our disadvantage we got in with a bunch of crazies. One of the things that we talked about was motivating counselors' use of computers. And one of the main things is to get parents and students interested in computers and what they can provide for them. Then parent pressure, community pressure, for the schools to provide those kinds of interactive informational activities for students might be highly motivating to counselors. Sometimes school boards and teachers and staff are somewhat threatened if they don't know quite how to use something. But if community members decide that that's what they want for the students, then that's probably a good place to start. Then we came up with an idea for maximizing student interest and that is to let them know that it's for them--a dial-a-date kind of thing. At dances many students stand around on the periphery, not involving themselves in the activity, because they've rejected each other. So give them the opportunity to put into the computer information that they feel is accurate about themselves, and then perhaps they might discover some really important things about each other. That would eliminate immediate visual rejection, which is usually shallow, and would allow them to obtain some clear information about one another that would have more substance. Overcoming anxiety. Probably one element of overcoming anxiety is to experience success, and so we can provide some entry-level kinds of experiences for people in which they succeed. Then they begin to like it, especially when they get that feeling of mastery over the system. Now, as to winning support for adoption--again, parents probably have more power than any group or coalition of powers within the education system itself. And students, once they get turned on, can exert a lot of pressure through their parents or through groups of students in getting something they want.

Participant: We took a different approach. We decided that names can be scary so we're not even going to refer to a computer as a computer. We thought maybe if we gave it a name like Ralph or just described it as being an assistant, that would make a difference with adults--and by adults we mean the superintendent and counselors and teachers. And we thought we could tell them that this assistant is to help them, that it will only do what they want it to do, and that they

have the control. We'd ask them to make two lists: What type of things do you do now that an assistant could do for you? What would you really like to do in this job that you would have time to do if you had an assistant? We kind of took a back-door approach.

Garry: I have a feeling that that concludes it. That was quite an impressive and creative list of ideas. We noted particularly the variety of methods and procedures that you used to arrive at some of your creative suggestions. We've presented this idea of creativity in counseling very quickly and in kind of a light vein, but we're definitely serious about it. We think the computer is such a potentially powerful tool that there is a major challenge in tapping into its inherent creative potential in our work situations. Libby?

Libby: To conclude, let me read one of the quotations from the Creative Quotes page we handed out earlier.

> The person who is capable of producing a large number of ideas per unit of time, other things being equal, has a greater chance of having significant ideas.

This means we should let our ideas flow and not be afraid of being far out or different, because the chances of coming across something that is really good are greater if we just let our thoughts pour out. I think this morning's example was outstanding, and we saw many instances of reinforcement for creativity—which, by the way, is one of the things that stimulates creativity as much as anything else. Thank you all for your willing participation.

THE WORKPLACE OF TOMORROW

Libby Benjamin

I am privileged to share with you today some visions of the future regarding work, workers, and the workplace—not that anybody has a crystal ball that will accurately foretell what is to come. Rather, the attempt will be to identify some significant trends and valid indicators that point to possible and probable future directions for people, occupations, and the work environment. As you know, one of our major activities at ERIC is to search, select, analyze and synthesize, to reduce what amounts to information overload into manageable chunks for specific audiences. So that was my task: to review the extensive literature on this subject from ERIC and a number of other sources and condense the available information into a form that would be understandable and informative.

Three major topics, it appeared to me, might be helpful in gaining a broader understanding of the workplace of tomorrow, and I would like to address each of these briefly: first, trends and developments deemed to have the most influence on work and workers over the next decade or so; second, the impact of technology on occupations and workers; and third, the implications of these trends and technological innovations for education and the helping professions.

Significant Trends and Developments

It is said that the most reliable way to ready oneself for the future is to study and understand the present. Some trends already occurring that will be the most probable forces for change in the coming years can give us a glimpse of the future world of work.

1. Organizational patterns and relationships. What is emerging is a change from the traditional, authoritative organizational pyramid to a matrix or network (which someone has said resembles a spiderweb), in which workers are more responsible and more involved in decision-making—not just subordinates carrying out orders. Workers are treated as peers by management, and personnel policies are more reflective of employee rights and due process.

2. Demographics and values. The next decade will see many changes:

   a. Slower population growth.

b. Increased numbers of women in the workforce. Women are expected to enter the labor force at the rate of nearly one million per year during the 1980s. The workforce participation rate for women was nearly 52 percent at the beginning of 1980, compared to 43 percent a decade earlier. This is expected to increase to 70 percent by 1990.

c. Increased numbers of minorities, especially Hispanics, in the workforce. Some recent forecasts are calling for 30 to 45 percent of the labor force growth over the decade to come from workers of primarily Hispanic origin. Others are forecasting that by the year 2,000 there will be 30 million Hispanics in the population.

d. An older workforce. The age of the average worker has now risen to 33 from 29 in 1977 (Wilkinson, 1981).

e. A more highly educated workforce. By 1985 over 50 percent of the population will have completed high school, up from 40 percent in 1975 (Wilkinson, 1981). We might note that while both blacks and Hispanics have made major gains in educational attainment, only 55 percent of Hispanics currently complete high school, compared with 75 percent for blacks and 85 percent for whites.

f. A geographic restructuring of the population from north to south.

With respect to values changes, traditional values emphasizing conformity, materialism, comfort, and success will still predominate. However, new values are emerging that emphasize "persons over institutions, quality over quantity, individualism over conformity, diversity over uniformity, experience over things, and participation over authority" (Wilkinson, 1981, p. 10). Allied to this shift in values is the growing middle-class revolt, and it is likely that there will be an increase in boycotts, class action suits, and Proposition 13-type legislation in the years ahead.

3. <u>The nature of work</u>. Welcome to Naisbitt's Information Society, where the thrust of most work emphasizes brains over brawn! Indeed in 1980, information workers comprised one-half (another source says 55 percent) of the labor force (Choate & Epstein, 1982), and this number is predicted to grow. Heavy industries are staffed mainly by technicians and are increasingly automated, with meaningless tasks performed by robots. There is a shift in the occupational structure from manufacturing and manual occupations to service, technical, and professional occupations--especially to the service sector. Workers performing every task from plumbing to neurosurgery have increased from 53 percent of the labor force in 1950

to 70 percent, and are expected to climb to 73 percent by 1995 ("A Remarkable Job Machine," 1984). Major gainers are expected to be secretaries, cashiers, nurses, and sales clerks, according to projections of the U.S. Bureau of Labor Statistics.

Surprisingly few jobs are coming from high technology and, in all, high-tech positions account for only about 13 percent of U.S. employment. Such numbers can be deceiving, however, because high technology has an explosive impact on other occupations. As Jerome Rosow, an Assistant Labor Secretary under President Nixon, said, "It generates jobs all around like a great catalyst." Although the number of people in high-tech occupations will continue to grow, it will be dwarfed by jobs requiring little or no higher education. For example, an additional 53,000 computer technicians will be needed by 1995, but business will be looking for 800,000 building custodians ("A Remarkable Job Machine," 1984).

4. The nature of the workplace. One of Naisbitt's megatrends is the explosion from a narrow, either/or society with a limited range of personal choices into a free-wheeling, multiple-option society--a trend clearly illustrated in people's choices regarding the workplace. Alternative work schedules, including shortened work weeks, work sharing and flex-time, are becoming accepted practices. We are moving toward creative combinations of education, work and leisure, customized to individual preference. Firms are experimenting with "rental" contracts from one organization to another in order to maintain skilled work forces during slack times. Contracting for specific task accomplishment, i.e., the use of consultants, utilizes specialized skills and promotes entrepreneurial efforts.

And we cannot overlook the dramatic changes being wrought by technology, but we will speak of that a bit later.

5. The changing economy. Over the next decade, inflation, high unemployment, higher energy prices, slow productivity growth, and the continuing shift to the information society will create uneven employment and unemployment distributions. Hardest hit areas for unemployment will be industries affected by changing technology and foreign competition. Those who are suffering most today are laid-off steel- and autoworkers. The response to the plight of these displaced workers has been varied. Some critics maintain that the heavily unionized employees have simply priced themselves out of jobs. To others, the laid-off employees are a national crisis. Lee Iacocca said: "To keep telling the people out of work in Pittsburgh or Detroit that they should become computer technicians or go into a service business is just a cruel hoax."

6. World view. We are increasingly shifting from a national to an international orientation. What happens in other countries has a direct impact on what happens here because of the intricate connecting web of economic relationships and communications. World reliance on U.S. grain production and our reliance on foreign energy demonstrate such interdependence. Growing investment in the U.S. by foreign corporations is also noticeable. The French Renault Corporation has moved into American Motors; Siemens A.G. of West Germany has acquired American firms; General Motors and Toyota have agreed to jointly produce a car.

While this list of developments that are moving us toward change is certainly not exhaustive, it does represent some of the major trends that will have critical influence on work and workers in the next decade.

The Impact of Technology

Every occupation has its own vocabulary which to the uninitiated may sound like mumbo-jumbo. Talk to a student of literature and you encounter terms like "protagonist" and "ekphrasis." Bridge players describe their triumphs or disasters by using such phrases as "King third," "under-ruff," and "check-back Stayman." But destined to become the star of esoteric language is high technology, which has been responsible for more new terms in less time than could have been imagined just a few years ago. Note these:

acoustic coupler
Z-80 processor
serial interface
baud rate
telecommuter
robotics
CAD/CAM
laser
telematics
fiber optics
microprocessor
Josephson junctions
floppy disk
smart machines

bubble memories

synchronous-orbital communications satellites

These are words that are here to stay and probably only represent the tip of the iceberg of what will be added as technology penetrates even more deeply into the fabric of society. And one more: "hacker." A hacker is a student who lives and exists only through and for his or her relationship to a computer. Such students take on strange computer names and slowly lose their identity.

The very rapid development of the electronic computer over the past 30 years has spawned thousands of new companies, created many new jobs, made possible new industrial and consumer products, enabled us to reach the moon and probe the universe. Small, powerful and efficient, computers today are bringing untold benefits and transforming our lives. Every person in our country experiences their effects. We encounter computers in grocery stores, banks, auto repair shops, libraries, travel agencies, hotels, department stores, and airports. Computers record our numerous credit card purchases. Radio, television, cable television, news networks, newspapers, weather forecasters, stock brokers and the stock market all depend on computers for rapid, up-to-date information. Computer accessed networks serve small businesses and personal networking needs. We engage in teleconferencing. Our national defense system, the Aeronautics and Space Administration, and national and international satellite surveillance systems all rely on the computer. Computer applications are revolutionizing data processing, information storage and retrieval, word processing, automatic accounting and inventory control, publishing, printing, and entertainment. The computer is also promising to be an invaluable aid in health care industries. A package at the University of Pittsburgh called INTERNIST can do a very acceptable job completing internal medical diagnoses. Stanford has a program called CONGEN that can conduct chemical analyses better than most chemists. Computers are increasingly found in schools, colleges, and universities, and with the advent of home computers, promise to become an integral part of the American family.

The use of electronic technology has indeed exploded. As evidence, consider the fact that while half a million computers were put to work between 1946 and 1977, a period of 31 years, a staggering 6.5 million were sold last year alone (Powers, 1984). Computers have been called the tool of the latter part of the twentieth century, and with their rapid development, every individual will need to develop computer skills or be left what has been called "partially disabled."

The use and development of robots is transforming manufacturing, changing the lives of workers and prompting a revolutionary change in international productivity. Today's reprogrammable, multifunctional robots can move materials, parts and tools; spray paint; weld; load and unload. Robots of the future will have vision, sensory abilities--seeing, feeling, and smelling--and be capable of decision-making.

So what does this mean so far as work and workers are concerned?

The degree to which technology increases or decreases the total number or type of jobs depends really on the balance between higher productivity (more output per worker) and possible new markets created by lower costs and new applications and capabilities of a good or service. It is possible that adopting a new technology can give a local industry or service the competitive edge and thereby engender more employment.

The U.S. Bureau of Labor Statistics has recently completed a new run of its model for forecasting employment by occupation and industry in 1990, and we find the following forecasts for high technology jobs in 1990:

Computer Analysts/Progammers	680,000
Engineers	1,500,000
Engineering Technicians	1,580,000

Demand is less strong for computer applications professionals:

Systems Analysts	28,000
Computer Programmers	36,000

Another kind of demand is for simpler, lower level applications that require less knowledge of machine languages and less experience. High school students can meet many of these needs, and the microcomputer in home or office is making many application skills as common as driving a car.

The Washington Post ("Job With a Byte," 1982) recently published a list of computer-related occupations currently in demand on the job market, including systems managers, marketing representatives, systems analysts, and computer programmers (all requiring a college degree, at least); service technicians (requiring one or two years of post-secondary training); and computer operators (requiring at least a high school diploma).

Let us examine briefly some specific areas of important technological innovation and expansion. In the telecommunications industry, changing technologies will have a direct effect on almost every occupation. Forecasters

concerned with the technology expect that mail carriers, telephone and cable workers, printing tradespersons, distribution and delivery workers, and bank tellers will experience a decline in labor demand. The decline of telephone operators due to new switching equipment is not expected to continue in the 1980s, however, as increasing demand for services is anticipated, and some experts believe that their employment may even increase. Potential areas of growth are cable television company technicians, laser technicians, and ground-based satellite technicians.

If we turn to computer applications, we find that the evidence is conflicting. Some analysts predict declines in labor demand for office workers due to the proliferation of office equipment. Other experts do not agree with this grim scenario for office workers. The Occupational Outlook Handbook forecasts an increase of more than 30 percent in employment for clerical workers between 1975 and 1985. Business Education Forum also proposes that computerizing offices will not dramatically affect labor demand for office workers in this decade:

> . . . we need to remember that our huge data files are created by workers keying necessary information into a machine. The workers are trained office employees. Whatever is meant by the paperless office, it is not going to appear overnight, it is not going to operate without manpower, and medium and small business is not going to be an immediate participant in these new systems. ("Business Education Forum," 1980)

Some job losses may be expected in the printing industry, however. Job gains are predicted for computer programmers, maintenance and service workers, operators, and analysts, as well as for other information-handling occupations.

The new manufacturing technologies seem likely to affect employment levels, occupations, and job and skill content in all aspects of product manufacture and use. These technologies will dramatically increase productivity, but this will tend to be a "jobless growth," resulting in little actual job creation. Exceptions are likely to be in maintenance and repair jobs, laser technician jobs, and some specialized computer-related jobs. The jobs not likely to survive the influx of new technologies may be agricultural harvesters for certain farm produce, garment industry workers in pattern-cutting and garment fabrication jobs, and semiskilled laborers such as riveters, loaders, and so forth in manufacturing/assembly jobs.

James O'Toole, who headed the University of Southern California's Twenty Year Forecast Project, sees no way out of the unemployment crunch and believes

that the computer is a job-destroying tool. Even if it frees people to do more creative work and have more leisure, it will be responsible for the loss of jobs for many blue-collar workers in their 40s and 50s, and even some in their 30s. The young and bright can possibly be retrained, but the picture is gloomy for older people, especially in the Midwest, where there are not likely to be as many employment opportunities. What to do with these people is a real dilemma.

Regardless of what the jobs of the future will be, or what skills they will require of workers, it seems clear where they will be. The trend is visibly toward the south and west. The best states, according to a U.S. News and World Report article ("Looking for Work?" 1984), are Arizona, Florida, and Nevada, among others. A review of the increase in workers over a ten-year period by Time magazine ("A Remarkable Job Machine," 1984) corroborates these findings, listing Alaska and Nevada as the top two in the ten best states in which to find jobs, with Arizona and Florida close behind.

Many experts believe that tomorrow's jobs will go to creative thinkers, that today's information age is really a "thoughtware economy." According to David Birch, an MIT population specialist, a "thoughtware economy" is one where muscle and physical dexterity are being fast replaced by brains and creative thinking (Powers, 1984). The top economic performers are coming out of areas that contain universities, i.e., that are intense pockets of thoughtware potential. Growth of the thoughtware economy, according to this author, will depend on knowing how to use the new technology creatively rather than on knowing how to manufacture it. High-tech manufacturing is really a small business and constitutes no more than 4 percent of the nation's work force—and probably will never employ more than 7 percent of it. The best way to grow in the thoughtware economy is to invent new ways to put the technology to better and better uses—which requires creative thinkers.

Implications for Education

As we are all aware, education or learning is always guided by changes in our society. Emerging trends dictate a restructuring of the goals of education, the financing of education, the delivery systems for education, the training of educational personnel, and the testing and evaluation of education, educational programs, and personnel. Because educational trends are really driven by economic and

occupational trends, the development of new technologies not only has implications for what we teach, but how we teach and counsel students. Our delivery system must adapt to the new technological advances, and the curriculum must reflect the world in which students are going to live as well as the one in which they are living today. The concept of lifelong learning used to be a kind of nice word. It is no longer a luxury for the few; it is a necessity for all. We are in a new era where the critical strategic resource is intellect, and the key to a prosperous future for individuals in our society is our educational system.

What forms of education will best prepare our youth for employment in a society marked by high technology, automation, efficiency, and depersonalized work environments?

In answering this question, we must be aware of some strong certainties about the future and their impact on education:

1. The technologies available in the information explosion, with their effect on teacher and counseling roles.
2. The need to prepare youth for a future of rapid change.
3. The fact that the technological revolution will alter the scool's functions.
4. The importance of the concept of interdependence and the need to solve national and international problems of over-population, poverty, unemployment, and human rights, to name a few.

Our schools are not doing as well as they might in providing youth with the general educational background and skills they need to cope successfully in today's world. Recently the National Postsecondary Alliance conducted seven regional two-day conferences on high technology and the two-year college, in which representatives from more than 40 firms, including General Motors, Bell Laboratories, IBM, Texas Instruments, and others, spoke while college administrators from the 32 member colleges listened (Long, 1983). Among the opinions, predictions, and suggestions resulting from these high-level meetings were the following:

1. Industry is into high-tech training because it is dissatisfied with what the schools are doing, and may soon be in serious competition with colleges for students in high-tech education.
2. The electronics industry is frequently disappointed with the graduates of two-year colleges compared with the graduates of six-month proprietary schools.

3. The aerospace industry, especially the military, is setting trends and creating innovations in the use of technology and in the training and development of its employees in computer-assisted learning systems. The military has become a first-rate technical educator.

In a recent estimate, the American Society for Training and Development found that industry annually invests 30 to 40 billion dollars in educating its employees. And this amount is not spent just for job-specific programs. Because traditional education in colleges and universities has not produced an adequate stock of literate, analytically competent graduates, or graduates with adaptable skills, corporations have begun to fill the need. A survey by the Center for Public Resources in New York revealed that employees with academic shortcomings cost U.S. businesses millions of dollars each year. They cited that 75 percent of the businesses in the survey reported problems so severe that they must provide remedial training for their employees.

Basically, then, the education of the 1980s, 1990s, and the twenty-first century must give students a strong foundation in the essential skills of reading, writing, and computing. It must prepare students for growth, adaptability, and further learning. Students must acquire skills in analysis and problem-solving. The newer technologies will require a higher level of verbal and mathematical literacy to work in the processing of information. Producing students who will be effective decision-makers will also be a goal for education.

Because our values influence and shape the choices we make, we must give strong emphasis to affective humanistic education that helps students be aware of their values and personal identification. Social science will become an integral part of the curriculum as we help students understand human interactions on a national and global basis. The curriculum of the future must emphasize social interactions and responsibility. It might well include technological and computer literacy, cooperative-living skills, basic survival skills, skills in developing viable life options, critical thinking, creative problem-solving, decision-making, communication skills, understanding of global issues, and use of mass media resources. Social betterment must be the desired end of both economics and education, and must have as its central concern the "human use of human beings."

So far as guidance professionals are concerned, in the decade ahead an increasingly important theme will be helping people to cope with rapid change and

technological advances (provided we ourselves are comfortable with these new developments). We need to collaborate with business, industry, and trade unions to help displaced workers handle the psychological trauma of obsolescence, learn job search skills, identify employable and transferable skills, and locate training programs to develop new skills. Career guidance professionals will need to address concerns related to appropriate use of leisure time and ways of seeking fulfillment not attained through work. As occupations dissipate, transform, and overlap, we need to help people redefine their roles in order to be effective career planners.

Some analysts predict that the work of the future will require more team and cooperative effort, resulting in a possible need for group process skills; others see a reduction in opportunities for person-to-person communication and depersonalized work settings, which may call for skill training in developing social networks that foster interpersonal relationships.

Our charge as professionals dedicated to the enrichment of human lives is to explore possible future trends and, in an effort to help others, become better equipped ourselves in dealing with an uncertain future.

The responsibility for keeping our country great rests with all of us, but the responsibility for taking some of the first steps toward that goal lies with our educational system. And we must make that journey, not with the faltering steps of indecision, but with the bold strides of confidence, knowing that we are going to be the masters and not the victims of our future.

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